this fact and by the present inadequacy of the supply, many roads have found it necessary to give increased supervision to the use of ice in order to curb the waste and to reduce losses which in certain forms tend to increase as the shortage elsewhere becomes more acute. This has also been the subject of recent instructions by certain of the regional directors. One road which found recently that its monthly consumption increased from 1,600,000 lb. at a certain terminal to approximately twice that figure for the same month this year under similar weather and traffic conditions, has since effected a large reduction in this consumption by increasing the supervision of the use of ice and enlisting the co-operation of employees in eliminating waste. The lesson which is now being gained can be observed with special economy this year, but it is worthy of more consideration than has been given it even in normal times.

The British Transport Bill

On July 10, the bill to establish a Ministry of Ways and Communications for the United Kingdom was passed by the House of Commons which has had it under consideration since the end of February, this year. The bill, as has been noted from time to time in the *Railway Age*, is characterized by its all-inclusiveness, for it practically puts in the control of one man—Sir Eric Geddes, the minister designate—nearly all the modes of transportation in the United Kingdom—railways, light railways, canals, waterways, inland navigation, roads, bridges, ferries, harbors, docks and piers. The government has stood up stoutly for the bill since its introduction and for that reason the bill has come through to its present stage with but few changes, these being in the form of concessions to the powerful dock and highway interests. Labor has stood with the government throughout the discussion both in the House and in the standing committee, and has especially opposed any steps that might in any way take from the bill its all-inclusive character. It has similarly made no attempt to hide its feeling and hope that the bill would eventually lead to nationalization on a large scale. It is surprising at first thought that with this in mind the railway managers and stockholders have not opposed the bill, but when it is realized that the railways of the United Kingdom are in a most serious condition financially and that the bill continues for an additional period the guaranty of dividends, the reason for their lack of opposition is plain enough. They also regard with favor the fact that Sir Eric Geddes, the minister designate, is a railway man and that five of his seven principal assistants will be railway men. Of course, it goes without saying that other interests have opposed this state of affairs, for they feel that the other modes of transport will be operated for the benefit of the railways, rather than otherwise. The term of the bill is for two years. The railway men of the world will watch with great interest to see how Sir Eric Geddes works out the problem of the eventual disposition of the British railways in the time he has available to arrive at a definite policy.

Block Signal Mileage Statement

The discontinuance of the use of the block system on American railroads in the year 1918, because of falling off in business, or for some reason, which was shown in the government report noticed in the *Railway Age* of July 11, page 56, seemed to be very extensive, the total length of road affected being over 2,000 miles; but this seeming recession in our safeguards against collisions is not so bad as it looks. Some of the statements can be explained. The large deduction to be made on the Baltimore & Ohio's eastern lines is offset by the increase on the western lines, the change being due to the transference of two divisions from the "Eastern" to the "Western" section of the system. The Erie advises us that the statement of that road as published is wrong—because, no doubt, of a clerical error. The Burlington informs us that the 141 miles shown in the table against that road is "purely a paper decrease," produced wholly by the exclusion of lines of joint track operated by other companies and erroneously reported in former years. On the Missouri Pacific, one piece of road 4½ miles long comes out because of the discontinuance of the electric train staff; but the rest of the mileage, six sections, ranging from 18 miles to 104 miles, was eliminated because the volume of traffic fell off; either all passenger trains were discontinued or the whole business of the section was done with one locomotive. The statistics of the block signal mileage of the country ought to be put on record somewhat more in detail. The totals which have been published in the last dozen years have served a good purpose in helping to keep up progress in this field, and the number of roads reporting 100 per cent. of their passenger line mileage worked by the block system is, undoubtedly, larger than would have been the case if no table had been issued; but there is room for further progress. Roads which provide the most complete safeguards should have due credit, and the facts should be lucidly shown. Roads which employ the space interval on lines of light traffic should have their enterprise recognized, and where a line is very "thin," requiring only one locomotive, that explanation should be set forth plainly. The extent to which permissive blocking is allowed on long block-sections ought to be known. In view of the bigness of the country and the impossibility of grasping the facts as a whole, it might be a good thing for the Interstate Commerce Commission to conduct an intensive study of a few typical roads, and make public a full and detailed report.

Accident Record Under Government Operation

THE ADVOCATES of government ownership of railways probably have criticised private operation of railways in this country more fiercely because of our railways' deplorable accident record than for any other cause. They have argued that the large number of casualties has been principally due to the fact that under private ownership our railways have been operated chiefly for profit, not to give the best and safest possible service; that under government operation they would be operated to give good and safe service; and that in consequence there would be a large reduction in accidents.

The *Railway Age* always has contended that this country's bad railway accident record has not been due to private operation, but to causes which would exist under either private or government operation; that the principal of these causes is the inability of the railway managements, under the conditions existing in the United States, to enforce such discipline as was enforced before the war on the railways of Germany, France and Great Britain; that discipline would be impaired rather than improved under government operation; and that therefore there would be more likely to be an increase than a reduction of accidents under that policy.

The Railroad Administration recently has issued statistics showing that there was a substantial reduction of accidents in the first three months of 1919 compared with the corresponding months of 1918. These statistics are gratifying, but not surprising, since the better weather conditions in 1919 and the smaller traffic handled were bound, other things being equal, to cause a reduction of accidents. The reduc-

this fact and by the present inadequacy of the supply, many roads have found it necessary to give increased supervision to the use of ice in order to curb the waste and to reduce losses which in certain forms tend to increase as the shortage elsewhere becomes more acute. This has also been the subject of recent instructions by certain of the regional directors. One road which found recently that its monthly consumption increased from 1,600,000 lb. at a certain terminal to approximately twice that figure for the same month this year under similar weather and traffic conditions, has since effected a large reduction in this consumption by increasing the supervision of the use of ice and enlisting the co-operation of employees in eliminating waste. The lesson which is now being gained can be observed with special economy this year, but it is worthy of more consideration than has been given it even in normal times.

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The Railroad Administration recently has issued statistics showing that there was a substantial reduction of accidents in the first three months of 1919 compared with the corresponding months of 1918. These statistics are gratifying, but not surprising, since the better weather conditions in 1919 and the smaller traffic handled were bound, other things being equal, to cause a reduction of accidents. The reduc-

tion doubtless was due both to these conditions and to the efforts to increase safety made by the officers and employees under the supervision of the Railroad Administration.

However, in order that the advocates of government ownership and operation may not base upon these statistics arguments which would be misleading, it is desirable to call attention to the fact that government operation has not by any means resulted uniformly in a reduction of accidents.

The Interstate Commerce Commission has recently issued "Accident Bulletin No. 69" which gives statistics of accidents for the nine months ending with September, 1917, and the nine months ending with September, 1918. These are the latest statistics available comparing accidents under private and government operation. Throughout the first nine months of 1917 the railways were privately operated, and were handling the densest traffic ever known up to that time. During six months of this period the country was at war and the railways were suffering from numerous changes in their employees and were losing many of their best men. During the first nine months of 1918 the country continued to be at war; the railways continued to suffer from changes in and losses of employees; they were handling almost the same volume of traffic as during the corresponding period of 1917; and they were operated by the government. A comparison of the railway casualties in these two periods is therefore interesting and may have some significance.

The accompanying table gives statistics taken from Accident Bulletin No. 69. Only statistics relating to fatal accidents are included, as the definition of an "injury" is so broad and flexible that statistics regarding injuries are much less significant than statistics regarding fatalities.

KILLED IN TRAIN OR TRAIN SERVICE ACCIDENTS

	Nine months ending Sept., 1917	Nine months ending Sept., 1918	Increase
NON-TRESPASSERS			
Employees on duty	1,879	2,089	210
a Trainmen	1,058	1,197	139
b Other employees	821	892	71
Employees not on duty	122	126	4
Passengers	192	394	202
Passengers carried under contract	33	38	5
Other non-trespassers	1,564	1,506	58*
TRESPASSERS			
Total trespassers	3,406	2,442	964*
a Employees	124	40	84*
b Other persons	3,282	2,402	880*
NON-TRAIN ACCIDENTS			
Industrial employees	308	389	81
Other persons	73	72	1*

*Decrease.

The table shows that there was an increase of 210 in the number of employees killed in train or train service accidents while on duty, and of 4 in the number of employees killed in such accidents while not on duty. The increase in the number of ordinary passengers killed in train or train service accidents was 202, or over 100 per cent. There was a slight reduction in the number of other non-trespassers killed in train or train service accidents, these being chiefly persons killed at highway crossings. There was also an increase of 81 in the number of industrial employees killed in non-train accidents. "Industrial employees" are chiefly employees working in the shops and therefore not directly engaged in train operation.

These statistics may not show the government operation increased accidents, but they certainly do show that fatal train and train service accidents increased either because or in spite of government operation.

The table also shows that the number of trespassers killed was reduced by 964, or from 3,406 to 2,442. This large and gratifying reduction in the number of trespassers killed undoubtedly was due chiefly to conditions produced by the war, and particularly to the enforcement of the "work or fight" rule. A large part of the trespassers killed under normal conditions are tramps, and the "work or fight" rule kept many tramps off railroad right-of-way. The reduction in the number of fatalities to trespassers is a striking indication of what could be accomplished by strict and consistent enforcement of laws prohibiting trespassing upon railway property.

"The 'A B C' of the Plumb Plan"

THE "PLUMB PLAN LEAGUE" has been organized to promote adoption of the plan of railroad ownership and management devised by Glenn E. Plumb. Warren S. Stone, Grand Chief of the Brotherhood of Locomotive Engineers, is president of the League, and the heads of fourteen other railway labor organizations are vice presidents. A pamphlet entitled "The A B C of the Plumb Plan" is being widely distributed by the league. It gives in question and answer form the details of the plan and the arguments in favor of it.

Any plan for the future ownership and management of the railways which the organized railway employees support is entitled to respectful consideration and to discussion upon its merits. The railway employees are a numerous body of American citizens, and because they are employees of the railways they will be as much affected, perhaps more affected, by the future of the railroads than any other class.

The "A B C," which apparently was prepared by Mr. Plumb, affords a basis for the discussion of his plan. It claims that enormous economies will be effected if the plan is adopted; that in consequence it will be possible to pay railway employees higher wages, to make large reductions in freight and passenger rates, and at the same time earn a surplus, which it is proposed should be divided between the officers and employees and the government. It is time to measure these claims and arguments by the standard of actual conditions and facts in order to determine what validity they have.

Under the Plumb plan the public would buy the railways, issuing bonds in payment for them. It would delegate their operation to a board of fifteen members, five appointed by the President of the United States, five by railway officers, and five by the classified railway employees. The board of directors would fix wages and salaries, as well as manage the roads, while the Interstate Commerce Commission would continue to fix passenger and freight rates. Disputes between officers and employees would be adjusted by boards to which the officers would elect five members and the men five. In case of failure to reach adjustment of a dispute it would be appealed to the directors. One-half of any surplus over interest charges earned would, as already stated, go to the government, and be invested in improvements and extensions and used to retire the bonds issued to buy the roads. The communities benefited would be required to pay for extensions if they could. Where, however, the general public and not a local community would be benefited the government would pay for the extensions. Doubtless, also, the government would have to pay for all improvements which could not be made from surplus earnings.

It is claimed that this is "a plan for the public ownership and the democracy in the control of the railroads." It is hard to see how it can be seriously claimed that it provides for "democracy in the control of the railroads," since it contemplates the purchase of the roads by all the people and their management by a board two-thirds of whose members would represent only that approximately one-fiftieth of the people who are employed by the railroads.

One ground upon which it is claimed that a large saving would be made under this plan is that "the public can obtain the money to purchase the lines at 4 per cent., whereas

the public is now charged rates to guarantee the roads 6 1-2 per cent. on their money. The saving on the present capital account of the railroads would be about $400,000,000 and on an honest valuation would be nearly twice this sum."

These sentences contain several statements which are erroneous. The public has never been "charged rates to guarantee the roads 6 1-2 per cent. on their money." The last year for which there are complete statistics of the Interstate Commerce Commission showing the property investment, the net capitalization and the net operating income of the railways, is the year ended December 31, 1916. In that year the percentage earned by the railways on their property investment was 5.8 per cent., and this is the largest percentage they ever earned. In the preceding five years the average earned, as reported by the Interstate Commerce Commission, was 4.56 per cent. However, it is undoubtedly true that the companies should be allowed to earn an average of at least 6 per cent on their property investment in order to enable them to operate successfully and raise sufficient new capital for extensions and improvements.

It is also incorrect, however, to say that the public can obtain money to purchase the lines at 4 per cent. The government finally had to pay as much as 4 3-4 per cent to raise about as much money to carry on the war as the reported property investment of the railroads, which is approximately $18,000,000,000. Since it was finally forced to pay 4 3-4 per cent to raise money to carry on the war, it cannot be assumed that it could raise enough to buy the railroads for less than 5 per cent. Now, if it allowed the railroads to earn 6 per cent. upon $18,000,000,000 this would be $1,080,000,000 a year, while if it bought them for $18,000,000,000 and paid five per cent. upon it, the interest would be $900,000,000 a year, or only $180,000,000 less than the net operating income of the properties would be at 6 per cent. Furthermore, if past experience is any criterion, if the railways earned 6 per cent they would put part of it back into improvements and extensions, while if the government earned only 5 per cent on the purchase price mentioned it would have to pay it all out in interest.

But, the "A B C" adds, a much larger saving even than $400,000,000 a year would be made if the roads were bought "on an honest valuation"; and elsewhere it asserts "the public will probably pay less than two-thirds of what the railroads claim as their value." The only foundation for this assertion is that some railroads are known to be over-capitalized. But other railroads are known to be under-capitalized. For example, the Pennsylvania System is capitalized at $430,000,000 less than the actual investment in it. Other large systems also are under-capitalized. The under-capitalized roads will more than offset the over-capitalized roads. Furthermore, the cost of reproduction must be given great weight in valuation; and the cost of reproducing the roads on the basis of present wages and prices would be vastly greater than their book cost. The "A B C" says that the courts would decide the value of the railroads if the public bought them; and the courts unquestionably would hold that the value which must be placed on them is not their original cost, but their present value. Instead of paying less than their present capitalization the public undoubtedly would have to pay much more for them than their present total capitalization or total reported property investment. Any person who really believes that under government ownership large savings in the capital charge of the railroads would be made is either ignorant of the facts or is deliberately misleading himself.

Besides reducing the capital charge, the "A B C" claims that the adoption of the Plumb Plan would result in a large reduction of operating expenses. For example, "A further saving" it is asserted, "would be in the operation of the roads as a unified system, which permits the interchange of equipment, the end of wasteful competition, and greater economy in buying supplies." But the roads have been operated as a unified system under government control for a year and half and are still being so operated. The present director general of railroads, Walker D. Hines, recently stated in testifying before the House Committee on Appropriations: "I think we have already gotten the benefit both last year and the early part of this year of the economies from unification." Mr. Hines doubtless knows as much about this matter as the author of the "A B C"; and the only way he intimated greater economy could be secured under unified operation is by getting a better class of labor, especially skilled labor.

Another argument made for the Plumb Plan is that it would give officers and employees an increased incentive to efficiency. As already indicated, officers and employees are to receive one-half of any surplus over interest charges that may be earned. Their share of the surplus is to be divided pro rata according to their salaries and wages among the officers and employees except that the officers are to receive twice as great amounts of "dividends" in proportion to their salaries as the employees receive in proportion to their wages. But salaries and wages are to be fixed by the board of directors, two-thirds of whose members will be elected by the officers and employees. How can it be assumed that under this arrangement salaries and wages would not be raised so high as to prevent any surplus from being earned? If a surplus were earned it would have to be divided with the government, while if salaries and wages were raised enough to prevent a surplus from being earned the officers and employees would get all of what would otherwise be earned as a surplus.

The answer made by the "A B C" is that the officers would be prevented from entering into collusion with the employees to advance salaries and wages because under this plan the officers would get twice as large a proportion of the surplus as the employees, while, on the other hand, if salaries and wages were raised so much as to prevent a surplus from being earned, the officers would be prevented from getting their "large dividends." But if a raise in salaries and wages were made the officers would know just how much they would benefit by it, while they would never know in any year how much they are going to get from the surplus at the end of the year, or, indeed whether there would ever be any surplus. Therefore the officers as well as the employees would have a far stronger incentive to raise salaries and wages than to try to earn a surplus. Certainly, this would be true at the start; for, if the roads were turned over to the officers and employees for operation under this plan without an advance of rates they would start with a deficit of one-half to three-fourths of a billion dollars a year. This would afford little ground for hope of a surplus.

Not only would this plan not afford any special incentive to officers and men to operate the properties efficiently in order to earn a surplus, but the plan itself would make efficient operation impossible. Two-thirds of the members of the managing board would be selected by the officers and the employees. But the officers are scattered all over the United States and are of many ranks and classes. The same thing is true of the employees. No means is conceivable by which men of so many ranks and classes, scattered all over the country, could possibly know and select as their representatives on the board of directors the men most competent to manage the railroads. A board thus selected would be certain not to be composed of men of the great knowledge, experience and ability needed. The board, in turn, would have to select the officers of the individual lines. But a board composed of men themselves wanting in needed knowledge, experience and ability, would be incapable of selecting or indisposed to select men of sufficient knowledge,

experience and ability to manage the various railway lines.

It may be said that the present officers of the railways would be retained. But it is doubtful if a board composed one-third of government appointees and one-third of labor appointees would be disposed to keep the present officers. Furthermore, it is certain that most of the present higher officers would not consent to work under the direction of such a board. They would quit the railroad business and go into other lines. Even if the present officers did stay they are not immortal.. Successors to them would have to be chosen from time to time; and competent successors could not and would not be developed and chosen under the organization proposed in the Plumb Plan. This ought to be plain to every intelligent railway employee. But if the railroads did not have competent officers they could not and would not be efficiently managed. If they were not efficiently managed, expenses would constantly increase, and service constantly deteriorate.

As a logical conclusion to the argument that vast economies would be effected under the Plumb Plan, the "A B C" makes the following statement: "Under this plan passenger rates of 1 1-2 cents a mile and the reduction of freight rates by 40 per cent. would be reasonable."

Just how much dependence railway employees and other persons can safely put upon the arguments and statements of fact made in the "A B C" will be indicated by the following analysis of this particular statement, which evidently was made to forestall opposition to the plan by travelers and shippers. During the first five months of 1919 the passenger earnings of the railroads were 50 per cent greater and the freight earnings 20 per cent. greater than in the corresponding months of 1917. Total earnings were 25 per cent greater and total operating expenses 57 per cent greater than in the same months of 1917. If these items of earnings and expenses shall throughout the year 1919 bear the same ratio to the similar items for 1917 as they did during the first five months of this year, passenger earnings for the entire year 1919 will be $1,238,000,000; freight earnings will be $3,395,000,000; total earnings will be $5,051,000,000; and total operating expenses will be $4,479,000,000. Now, passenger rates at present are 3 cents a mile. Therefore a reduction of them to 1 1-2 cents would reduce passenger earnings per year approximately $614,000,000. A 40 per cent. reduction of freight rates would reduce freight earnings per year approximately $1,358,000,000. These reductions in passenger and freight rates, on the basis of present business, would reduce total earnings per year from about $5,051,000,000 to about $3,075,000,000. But as we have seen, total operating expenses are now running at the rate of $4,479,000,000 a year. Therefore, after the reductions in earnings caused by these reductions in rates had been made, the total operating expenses of the roads would exceed their total earnings by $1,405,000,000 a year. But railway taxes as well as operating expenses must be paid. Taxes and operating expenses together would exceed total earnings by about $1,600,000,000 a year. Then if in addition there was, say, $900,000,000 a year interest to meet, the deficit to be paid by the public from taxes would be $2,500,000,000 a year. Talk about the "surplus" to be divided between officers and employees and the public! And while the "plan" proposes that the public should get only one-half of the surplus, if there should be one, it also proposes that the public should get all of the deficit, if there should be one. It would be a singular kind of "democracy in the control of the railroads" which would make the public pay the entire bill for buying the roads, give it only one-third of the managing directors, give it only one-half of the surplus if there was any, and send it the entire bill for the deficit if there was one!

But, it is said, the reduced rates would cause an increase of traffic. No doubt. But any increase in the traffic to be handled would also cause an increase of expenses. We are curious to know how much of an increase of traffic the author of the Plumb Plan thinks would be sufficient to offset the increase of expenses which would be caused by an increase of business and in addition a deficit of about $2,500,000,000 a year.

It can hardly be necessary to carry the analysis of the Plumb Plan and its "A B C" any further to show how preposterous they are. In fact, we have taken the trouble seriously to analyze them at all only because earnest and honest people have been misled in the past by equally preposterous arguments and assertions. We have repeatedly recalled that, in December, 1917, within two weeks of the time that government operation was adopted, an advocate of government ownership, in testifying before a Senate Committee in Washington, estimated that under unified government operation a reduction of $400,000,000 a year in railway operating expenses could be made. The country has now had one and a half years of government operation; and at present operating expenses are running $1,600,000,000 a year more than they were when this advocate of government operation made his estimate, and $2,000,000,000 a year more than he estimated they would run. Yet there were many people who accepted such arguments of advocates of government operation before it had been tried. It is to be feared that unless they are answered again and again, such assertions and arguments as those advanced in support of the Plumb Plan also will be seriously accepted.

Railway employees are contributing money to pay for the circulation of the "A B C" and other literature advocating the ownership of the railroads by the public and their management by the employees. It will be wise for the employees to study for themselves the statements made in this literature and test it by the facts, before they help in its distribution. Doubtless many employees are supporting the Plumb Plan because they believe its adoption would inure to their special benefit as a class. They could not be more mistaken. A plan better adapted to cause inefficiency and waste in the operation of the railroads could hardly be devised; and no class have more to lose in the long run by inefficient management of the railroads than the employees.

Besides, railway employees have nothing to gain and much to lose by supporting a plan of railroad ownership and management which is adapted, as this one is, to give the public the impression that it is intended to promote the selfish interests of the employees regardless of its effects upon the public. No plan which gives this impression will be adopted; but its support by the employees is sure in time to create public opinion hostile to them and their organizations.

Great Northern

If James J. Hill were alive one can imagine what his feelings would be in regard to an operating ratio for the Great Northern of 84. The ratio of transportation expenses (the cut of pocket cost of moving the freight and passenger business) was 43 per cent in 1918. On the Great Northern the ratio of transportation expenses to total operating revenues increased from 36 in 1917 to 43 in 1918 and the ratio of maintenance expenses, including both way and equipment, to total operating revenues increased from 26 in 1917 to 38 in 1918. For all the roads of the country transportation expenses increased from 38 per cent in 1917 to 42 per cent in 1918 and maintenance expenses increased from 28 per cent to 36 per cent of total operating revenues. The operating ratio and especially the ratio of transportation expenses to gross operating revenues of the Great Northern was

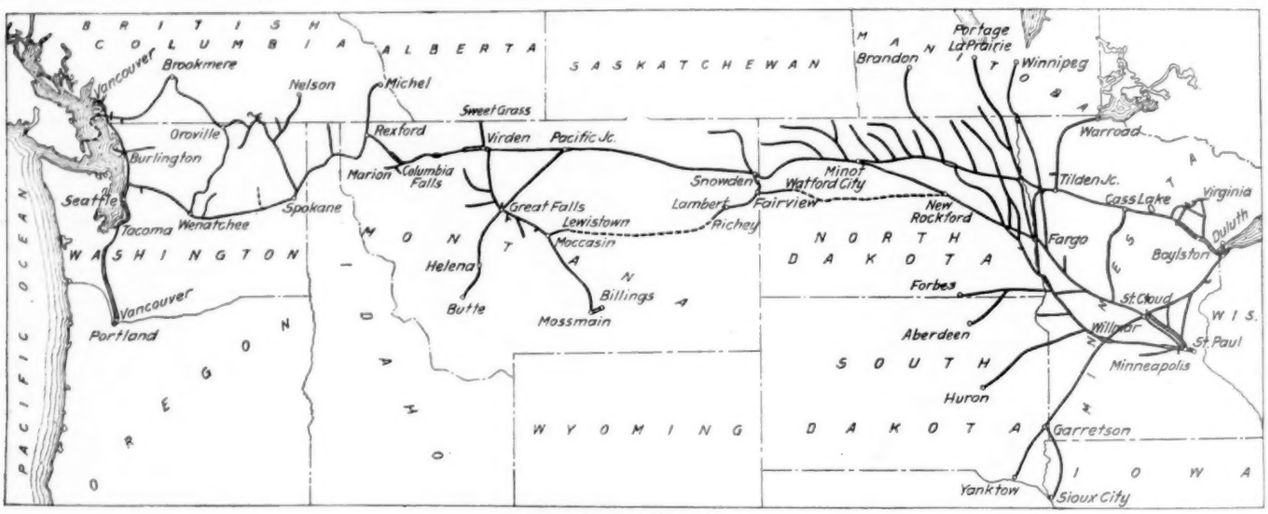
something of which in his later life James J. Hill was particularly proud. In the ten years prior to 1917 the operating ratio varied from 54 to 61 and the ratio of transportation expenses to operating revenues varied from 29 to 27. In 1917 expenses had begun to run up rather rapidly. In that year total operating revenues amounted to $88,599,000 and total operating expenses to $59,282,000, an operating ratio of 67. In 1918 total operating revenues amounted to $100,699,000 and total operating expenses to $84,429,000, an operating ratio of 84. The increase in revenues was due to a slight increase in ton-mileage of revenue freight and to an increase in the revenue per ton-mile of 14 per cent, making the average revenue per ton per mile in 1918, 8.699 mills. There was a decrease in passenger business (passengers carried one mile) of 10 per cent, the passenger mileage being 601,000,000 in 1918. This loss in passenger business was not completely offset by an increase of two mills in the average passenger mile rate. The average received per passenger per mile on the Great Northern in 1917 was 2.4 mills, in 1918 it was 2.6 mills. In other words, the increase in regular fares, exclusive of troops, etc., to three cents a mile for the whole country affected the Great Northern very little.

The rental which the government pays to the Great Northern Railway Company is $28,771,000. In addition the company had in 1918 $1,072,000 other income, making a gross corporate income of $29,758,000. After the payment of interest, sinking fund and corporation taxes there was $20,063,000 available for dividends and the regular seven per cent dividend on the stock calls for $17,463,000.

Whereas the rental which the government guarantees was $28,771,000, the net operating revenue before the payment of taxes by the government was $16,269,000. The taxes which the Railroad Administration had to pay in 1918 are not given except on a per mile basis, but apparently the operating income, exclusive of rentals in 1918 was approximately $10,600,000. This is a heavy loss, indeed, from the operation of a property which has generally been regarded as one of the most perfectly developed transportation machines in the world. Even with ample facilities for a detailed study of the operations of the Great Northern in 1918 an "explanation" of the showing would be little better than a guess. On the other hand, even without such detailed information, it is possible to name some of the factors which may have entered into the situation. Under Hill the Great Northern was developed to meet a particular set of conditions. The old man used to remark that to be a successful railroad manager one had to guess right to a copper cent in estimating the cost of moving a ton of freight one mile. The nice adjustment of the Great Northern's operations to its traffic conditions was an important factor in the financial success of the operation of the property. Traffic conditions in 1918 were no longer under the control of the Great Northern's own organization, much less under the control of the great railroad genius who built up the property.

The Great Northern lies in the Northwestern region, of which R. H. Aishton, formerly president of the Chicago & North Western, is regional director. The federal manager of the Great Northern is W. P. Kenney, who was president and before that vice-president in charge of traffic of the Great Northern and whose railroad experience has been in the traffic department and in office work. The general manager was J. M. Gruber, formerly vice-president of the Great Northern in charge of operation, and with the reputation of being one of the best operating men in the west.

The falling off in passenger traffic and the very slight gain in freight traffic has already been mentioned. As a matter of fact, had it not been for an average haul of freight of 286 miles or four per cent longer in 1917, freight traffic would have increased less than one per cent. On the other hand there was an increase in freight train miles of four per cent, the total freight train miles in 1918 being 12,111,000. Furthermore, there was an increase of 12 per cent in helper locomotive mileage, the total in 1918 being 531,000 miles.



The Great Northern

Car loading improved, the average tonnage of revenue freight per loaded car being 26, as against 24 in 1917, an increase of nine per cent, thus making a decrease of 3½ per cent in the loaded freight car miles. On the other hand, empty freight car mileage increased 21 per cent, totaling 147,521,000 in 1918.

The Great Northern spent a total of $6,799,000 during 1918 for additions and betterments. Included in these additions and betterments was the building of 52 miles of additional side tracks and 38 miles of second track, and the installation of automatic signals on 120 miles.

The following table shows the principal figures for operation for the Great Northern as operated by the Railroad Administration. It is not the company's income account.

	1918	1917
Mileage operated	8,260	8,233
Freight revenue	$76,937,445	$64,300,666
Passenger revenue	15,672,420	15,836,341
Total operating revenues	100,698,520	88,598,735
Maintenance of way and structures	17,405,470	11,570,157
Maintenance of equipment	20,757,399	11,890,989
Traffic	778,989	1,336,870
Transportation expenses	43,024,345	32,262,501
General expenses	1,246,744	1,133,911
Total operating expenses	84,429,245	59,282,156
Taxes*	5,525,060	6,306,478
Operating income	10,744,215	23,010,101

* Estimated from the per mile figures given in the 1918 annual report.

Railroad Hearings Before House Committee

U. S. Chamber of Commerce Presents Comprehensive Plan for Remedial Legislation

WASHINGTON, D. C.

A COMPREHENSIVE PROGRAM of remedial railroad legislation adopted by the National Transportation Conference called by the Railroad Committee of the Chamber of Commerce of the United States, which represents a sort of composite of the views held by the principal interests that have been devoting their efforts to a proper solution of the railroad problem, was presented to the House Committee on interstate and foreign commerce on Tuesday by Harry A. Wheeler, chairman of the conference, and supplementary statements relating to various phases of the subject were to be presented by Paul M. Warburg, formerly vice-chairman of the Federal Reserve Board; W. W. Salmon, representing the Railway Business Association; Alexander W. Smith of Atlanta, Ga., and Emory R. Johnson, professor of transportation and commerce, University of Pennsylvania. Before outlining the plan Mr. Wheeler gave an explanation of its origin to show the representative character of those who took part in formulating the program.

The National Transportation Conference was called together in December, 1918, "to consider the broader aspects of the transportation problem and the formulation of a basis for the control and operation of the transportation facilities of the United States after the conclusion of the present government control." At 5 meetings, each lasting 2 days, the conference has held 22 general sessions and numerous sessions of sub-committees appointed to report on special phases of the transportation problem. In calling this conference the Chamber of Commerce recognized that many different interests are affected by transportation and that each important interest should have a voice in determining what should be done with the railroads. It therefore invited prominent men belonging to each important interest to attend the conference and take part in its deliberations. All of the important plans were presented either in the form of printed documents or by speakers who addressed the meetings or took part in the discussions.

The shippers' and manufacturers' point of view was presented by Walter S. Dickey, of the W. S. Dickey Clay Manufacturing Company, of Kansas City; Edward J. Frost, vice-president, William Filene's Sons Company, Boston; George A. Post, president Standard Coupler Company, New York; Charles E. Lee, of Ford, Bacon & Davis, Consulting Engineers, New York City; W. W. Salmon, president of the General Railway Signal Company; Charles S. Keene, vice-president of the American Tobacco Company, and Frederick J. Koster, president of the San Francisco Chamber of Commerce.

The measures in which farmers are interested were outlined by H. C. Stuart, chairman of the National Agricultural Advisory Committee; R. L. Munce, president of the Pennsylvania Good Roads Association, and Eugene D. Funk, of Funk Brothers' Seed Company, Bloomington, Illinois.

Important financial aspects of the railroad problem were discussed by Paul M. Warburg, formerly vice-governor of the Federal Reserve Board; Harry A. Wheeler, vice-president, Union Trust Company, Chicago; Nathan L. Amster, president of the Investors' Protective Association of America, and Luther M. Walter, general counsel of the National Association of Owners of Railroad Securities.

The views of labor were presented by Frank Morrison, secretary; Henry Sterling, legislative representative, and Martin Ryan, of the Railroad Employees' Department of the American Federation of Labor; and those of the Railroad Brotherhoods by A. B. Garretson, president of the Order of Railroad Con-

Grounds for Business Confidence; Importance of Labor Situation*

By E. H. GARY,
Chairman of the United States Steel Corporation.

Never before in the history of our country has the outlook for future business been so bright, the opportunity for success so great. We are rich, we are prosperous, our resources are enormous. There is no doubt as to our financial security or our commercial progress. I predict that the next five years on the average will bring to our country the most progressive and prosperous period in its history.

There is a large and fairly profitable business ahead, but we need to be conservative, thoughtful, fair-minded. There should be no danger of business depression if the return to a peace basis is accomplished methodically and with justice to all. It is a time for constructive thought; for courage, even for sacrifice, for our problems are numerous and difficult.

FOREMOST in importance is the labor situation. Wages during the war increased materially. I believe we have not been paying more than is right and proper. The cost of living has increased and unless it is reduced wages cannot be lowered.

Employers insist they cannot reduce their selling prices; many hold they should have a higher scale. Prices generally in this country are abnormal; but simultaneous reductions in all directions would be impracticable. Reductions, therefore, must be gradual. And we should not begin with wages.

With respect to their compensation our workmen must be treated liberally. We must consider them as our valuable associates, give them no reason for complaint. If they are treated fairly they will give fair treatment in return; if their confidence is retained their loyal support is assured.

As I have said before, business conditions are good. The needs of the buying public are increasing. The enormous wheat crop, which exceeds by far the first calculations, will soon be harvested. Other crops, too, are coming on, and from all appearances the yield this year will be a record one.

Witness the crowds at the large new hotels. It is next to impossible to obtain a room. They are thronged with travelers from all parts of the land. From all sections—the South, Southwest and the Far West—they bring good reports. Their confidence in the future has charged them with optimism.

Consider the great number of purchasers to be found in retail stores. Try to rent a house in New York; they are scarce, and prices are mounting. Gaze upon the great crowds of busy people upon city streets and the constant stream of motor cars in city and country.

EVIDENCES of business activity and prosperity are everywhere. The estimated wealth of our country is more than equal to one-third of the total wealth of the world; our banks hold $15,000,000,000 or $16,000,000,000; the money in circulation is approximately $56 per capita; before the war it was $34.

Confidence is justified. And confidence, with patience, assures prosperity.

*An article in the New York *Evening Mail*, July 16, 1919.

ductors; W. G. Lee, president, and W. N. Doak, vice-president, of the Brotherhood of Railroad Trainmen; and S. E. Heberling, international president of the Switchmen's Union of North America.

Director General Hines appeared before the conference twice and explained the plans of the Railroad Administration and his own personal views in regard to the desirable solution of the railroad problem. Commissioner Winthrop M. Daniels, of the Interstate Commerce Commission, and President Charles E. Elmquist, of the National Association of Railway and Utilities Commissioners, participated actively in the deliberations of the conference.

The plans proposed by the Railway Executives' Association and by leading individuals among the executives were outlined by Daniel Willard, president of the Baltimore & Ohio; S. T. Bledsoe, general counsel of the Atchison, Topeka & Santa Fe; and E. G. Buckland, president of the New York, New Haven & Hartford; The views of the electric railway men were presented by P. H. Gadsden, chairman of the Committee on National Relations of the American Electric Railway Association, and W. V. Hill, manager of the Washington office of the association; and those of the advocates of highway transport development by John T. Stockton, president of the Joseph Stockton Transfer Company, Chicago.

The economic aspects were discussed by E. R. A. Seligman, professor of economics, Columbia University; Emory R. Johnson, professor of transportation and commerce, University of Pennsylvania; W. Z. Ripley, professor of Transportation, Harvard University; John R. Commons, professor of economics, University of Wisconsin; Henry W. Farnam, professor of Political Economy, Yale University, and Frederick A. Cleveland, formerly chairman of President Taft's Commission on Efficiency and Economy; and the civic and social aspects by R. G. Rhett, formerly president of the Chamber of Commerce of the United States; Alexander W. Smith, of Atlanta, Georgia, formerly president of the Georgia Bar Association; Judge F. C. Dillard, of Sherman, Texas, and Charles P. Neill, chairman of Board of Adjustment No. 1, United States Railroad Administration, and formerly commissioner of labor under the Roosevelt administration.

The conference gave careful consideration to the various plans with a view to developing a program that would include the most desirable features of each plan, combining them with new features proposed by the conference itself into a consistent harmonious whole. Some of the representatives of the railroad brotherhoods and a few of the other participants attended only one or two meetings for the purpose of presenting their views, and did not take part in the resulting action. Others attended all of the sessions and voted on all questions brought before the conference, occasionally reserving the right to dissent from some particular decision with which they could not agree. The majority of the members, however, attended practically all of the 22 sessions held and voted in favor of the program finally adopted.

H. A. Wheeler

Program of Remedial Railroad Legislation Adopted by the Transportation Conference

The program adopted by the conference is as follows:

Section 1. The Transportation Conference favors corporate ownership of the railroads in the United States; and is therefore opposed to government ownership of the roads and to their operation either by the government itself or, under lease from the government, by corporations whether organized as regional monopolies or as large competing systems.

Section 2. The conference favors the enactment of remedial railroad legislation at the earliest possible date. It favors the continuation of the present government possession and operation of the railroads only until such legislation can be enacted and made effective. If possible, legislation should be enacted within the present calendar year.

Section 3. The conference is in favor of permitting and facilitating the consolidation, in a manner to be approved by the government, of existing railroads into strong, competitive systems so located that each of the principal traffic districts of the country shall be served by more than one system.

Section 4. The conference favors action by Congress that will bring all interstate railroads as corporations under the jurisdiction of the United States either by federal incorporation or in such other manner as Congress may determine, the matters of local taxation and police regulation to be reserved by the States.

Section 5. The conference favors federal regulation of the issuance of securities by all railroads engaged in interstate commerce. This regulation should be exclusive and should be exercised in the following manner: Such federal agency as Congress may designate, shall be authorized to pass upon the public necessity for expenditures of capital (in excess of a stipulated amount) by carriers engaged in interstate commerce and to determine the amount and to regulate the conditions of the issuance of securities to obtain the funds required to cover authorized capital expenditures; a railroad company applying to the federal agency for authority to make capital expenditures, or to issue securities, shall be required to file with the proper authorities of the states in which the railroad is located copies of the original petition; and the federal agency shall be required to notify said state authorities of the hearings upon the petition.

Section 6. The conference favors the sole regulation by the Interstate Commerce Commission of all railroad rates and of all rules and regulations bearing thereon affecting interstate commerce. For the performance of its duties the commission should be given power to organize in the manner it may deem best, and be given authority to function through

such local officials or agencies as it may deem necessary to create or designate.

Section 7. The conference favors the creation of a Federal Transportation Board of five members. It shall be the general duty of the board to promote the development of a national system of rail, water and highway transportation, to inquire into and propose measures for preventing abuses therein, to pass upon the public necessity for capital expenditures and to regulate security issues as provided by Section 5. The Federal Transportation Board shall act as the referee in cases of the disagreement (deadlock) of a board entrusted with the adjustment of wages, hours of labor or other conditions of service of railroad employees. It shall, also, be the duty of the Federal Transportation Board to administer and enforce the means and measures that may be provided for strengthening and stabilizing railroad credit; it shall determine the grouping or consolidation of railroads deemed to be in the public interest, and carry out plans authorized by Congress for merging all railroads engaged in interstate commerce into strong competing systems severally owned and operated by companies subject as corporations to the jurisdiction of the United States.

Section 8. The conference favors the adjustment of wages, hours of labor and other conditions of service of railroad employees by boards consisting of equal numbers of representatives of employees and officers of the railroads, with appeal, in case of the disagreement (deadlock) of an adjustment board, to the Federal Transportation Board as referee.

The conference favors the adoption by Congress of the plan contained in the following Sections, 9 to 19 inclusive, for the purpose of strengthening and stabilizing railroad credit, of protecting the interest of the investing public and of promoting, in the highest degree both legal and moral accountability upon the part of railroad directorates and of railroad executive officers, and of bringing about as promptly as practicable the consolidation of existing railroads into such number of competitive systems, owned and operated by companies subject as corporations to federal jurisdiction, as shall be found to be in the public interest.

Section 9. The conference recommends that a statutory rule be enacted by Congress requiring that railroad rates and fares, to be established by public authority, shall be designed to yield the railroad companies in each traffic section of the United States (as shall be designated by federal authority) aggregate revenue sufficient to produce, after proper provision has been made for renewals and depreciation, a net return (which shall be available for interest and dividends) of not less than six (6) per cent. per annum upon the aggregate fair value of the property of the railroads devoted to the public service in each of the several sections. The items of "renewal and depreciation" shall also include unproductive improvements not properly chargeable to investment account and against which no capital or capital obligations shall be issued.

Section 10. The net return to be obtained by the railroads as a result of the enforcement of a statutory rule of rate making shall be based upon a fair value of the railroad property devoted to the public service, as ascertained by the Interstate Commerce Commission, such valuation to include a consideration of physical property, earning power, and such other elements as may be proper in determining fair value.

Until such valuation shall have been determined, the valuation to be adopted for the railroads in the United States as a whole, and by traffic sections, shall, for the purpose of making the rates that yield the aggregate net return to be provided by statute, be their aggregate railway property investment accounts.

For the purpose of ascertaining excess income, the valuation of any individual railroad system, pending the completion of the said federal valuation, upon which it shall be entitled to retain six (6) per cent. per annum, shall be that proportion of the aggregate property investment accounts of all the railroads of the traffic section in which it is located, which its average annual railway operating income (computed for the period and in the manner prescribed by the federal control act of March 21, 1918) bears to the aggregate annual railway operating income of all the railroads of such traffic section, computed in the same manner; provided, first, that if the use of the above stated formula shall produce a valuation of any particular railroad system, greater than the amount of its average property investment account for the three year period ending June 30, 1917, the amount of such property investment account shall be used instead of the valuation derived by the formula; and provided, second, that nothing herein contained shall operate to reduce the railway operating income which any particular railroad system shall be permitted to retain below its annual average railway operating income, or compensation as computed or allowed to it under the federal control act of March 21, 1918. To such valuation as shall be derived for any railroad system in the manner above stated, there shall be added all increases of property investment made by such system after June 30, 1917.

The Federal Transportation Board shall be vested with the same power to make such specific adjustments, in particular cases, as it may deem requisite and equitable, as is conferred on the director general of railroads under the railroad control act, March 21, 1918.

Section 11. All railroad companies engaged in interstate commerce shall be required to observe the following regulations under the direction of the Federal Transportation Board:

(a) Whenever the net railway operating income of a railway company available for the payment of interest and dividends (after provision has been made for renewals, depreciation and unproductive improvements as defined in Section 9) shall exceed six per cent upon the fair value of its property, or upon its temporary valuation as determined by Section 10 (the "fair value of property" being used in this section to include both temporary and permanent valuation) one-half of the said excess railway operating income above six per cent shall be placed in a contingent fund of the company until such amounts to six per cent of the fair value of the company's property. The remaining half shall be turned over to a general railroad contingent fund as provided by Section 12.

(b) A railroad company may draw upon its own contingent fund whenever, and to the extent that, its said annual railway operating income shall fall below six per cent of the fair value of the property as determined by Section 10; but whenever the railroad's contingent fund is thus drawn upon, the fund shall be replenished from the company's share in subsequent excess earnings until the fund is restored to six per cent of the fair value of the company's property.

(c) When any individual railroad company earns an annual railway operating income of six per cent upon a fair value of its property and has established and is maintaining a contingent fund of its own amounting to six per cent on the fair value of its property, the company shall turn over to a general railroad contingent fund, two-thirds of the company's railway operating income in excess of six per cent, the remaining one-third of said excess to be retained by the railroad company for distribution among its stockholders or for such other lawful purposes as it may determine.

Section 12. There shall be established a general railroad contingent fund for the purpose of making good any deficiency in any year below six per cent upon the aggregate fair value of the properties of the railroads of a section. The amount of such deficiency shall be drawn from the general railroad contingent fund for distribution among the railroads in any traffic section, upon the basis of the

gross earnings from railroad operations of the railroads within such section; and if the result of this distribution causes the railway operating income of any individual railroad to exceed six per cent this excess shall be applied as provided in Section 11.

Section 13. In any year, following the completion of the mergers hereinafter provided for, when the yield from rates established by federal authority equals six per cent upon the aggregate fair value of the property of the railroads in any traffic section, and the total contribution made in any such year to the general railroad contingent fund amounts to less than five per cent of the aggregate net earnings from operation in that traffic section, then the railroads in that section shall contribute to the general contingent fund the sum necessary to bring the contribution for the year up to five per cent of the aggregate net earnings from operation—each company being required to contribute for this purpose pro rata to its net earnings from operation for that year.

Section 14. The general railroad contingent fund shall be managed by trustees appointed by the Federal Transportation Board from men nominated by the railroad companies. Moneys turned over to the fund shall be invested by the trustees in United States Government securities, or shall be deposited in the Federal Reserve Banks.

Section 15. The general railroad contingent fund shall be accumulated by its trustees until it amounts to $750,000,000, and be maintained at that sum for the purpose hereinbefore provided, and any excess thereafter acquired shall be used when and as directed by the Federal Transportation Board for the development of the railroad transportation system of the country, or for the increase of transportation equipment and facilities, or for the pro rata reduction of the capital or capital obligations and property investment accounts of the railroads, or, if so ordered by Congress, the excess shall be turned over to the Treasury of the United States.

Section 16. To facilitate the prompt stabilization of railroad credit and such consolidation of railroads as the Federal Transportation Board shall decide to be in the public interest, it is recommended that Congress create a railroad reserve fund and appropriate for this purpose the sum of $500,000,000. This fund shall be administered by the Federal Transportation Board which shall invest it in United States bonds or notes, the interest accruing from such bonds or notes, or the earnings upon the proceeds thereof, to be paid annually into the United States Treasury. In case, at any time during the first 10 years after the enactment of this legislation, the general railroad contingent fund, provided by Section 12, shall not be sufficient to make good deficiencies as described in that section, then the Federal Transportation Board shall pay into the general railroad contingent fund, as far as the board's available funds permit, the amount necessary to enable the trustees of the general railroad contingent fund to make over to the railroads the sums due them for that year under the stipulations of said Section 12; provided, however, that any sums so paid by the Federal Transportation Board shall be repaid with interest by the trustees of the general railroad contingent fund from contributions received from the railroads after the general railroad contingent fund shall reach and be maintained at the amount of $500,000,000.

Section 17. The consolidation of railroads into a limited number of strong competitive systems under conditions to be prescribed by Congress is believed to be in the public interest and should be carried out as promptly as practicable, in accordance with plans to be submitted by the carriers and approved and announced by the Federal Transportation Board. In order to bring about this consolidation of railroad companies, jurisdiction of which has been perfected as contemplated in Section 4, the Federal Transportation Board shall determine for itself and announce the grouping of railroads in case such railroads have not within a reasonable time submitted plans for its approval for consolidation in any given section and the Board deems such consolidation to be in the public interest.

If the consolidations thus announced by the Transportation Board shall not have been affected or well advanced within five years after announcements the Board should be given power to carry through such mergers by compulsory proceedings, if in its judgment the public interest would be thereby advanced.

Section 18. Any railroad corporation, that may be allowed by the Federal Transportation Board to acquire the securities or properties of other railroad companies and to form a consolidated railroad system under the jurisdiction of the United States, shall be required by the Board to organize with a board of twelve directors, one of whom shall be a representative of the employees of the system and nominated for that position by such employees, and three of whom shall be selected by the Federal Transportation Board to represent the principal interests involved in the territory served by such system. The board of directors thus selected shall make such regular and special reports to the Transportation Board as that Board may require.

Section 19. Should it be found by the Transportation Board to be in the public interest to protect the credit and financial operations of some railroads pending the completion of the railroad consolidations herein contemplated, it is recommended that one or the other of the following plans be adopted:

1. That the Transportation Board be endowed with power, and granted the necessary funds to extend credits to such railroads during the period of consolidation; or
2. That the existing machinery of the War Finance Corporation be employed for this purpose.

If the second recommendation is adopted, appropriate legislation should be enacted to enable the War Finance Corporation to advance funds to railroads under terms that may be approved by the Federal Transportation Board.

Statement by Harry A. Wheeler

An abstract of Mr. Wheeler's statement follows:

Return of the Railroads to Corporate Operation

Necessarily, the first question considered by the conference was whether it favored corporate or government ownership and operation of the railroads. After full consideration the conference, with but few dissenting votes, decided in favor of corporate ownership and operation, and the return of the roads to their owners as soon as possible after the enactment by Congress of appropriate remedial legislation. The conference was in favor of the continuation of government operation until such legislation had been enacted and made effective, but felt that this legislation should, if possible, be enacted within the present calendar year.

A Statutory Rule of Rate-Making, Without Government Guarantee

The most fundamental problem to be solved by the legislation that must precede the return of the railroads to their owners is the adoption of measures that will give the carriers reasonable assurance of revenues sufficient to enable them adequately to perform the services required by the public. In the interest of the carriers and the public the authority which determines rates must adopt measures that will afford the carriers reasonably adequate revenues.

One method is to provide a definite government guarantee of a fixed minimum net return. A government guarantee is not favored by the conference. It believes that it will be possible for Congress to adopt a policy of rate-making

and control that will give the carriers reasonable assurance of adequate revenues without involving the government in the obligation of guaranteeing the net return of private corporations and without imposing upon the public the burden of unreasonable transportation rates.

Briefly stated, it is recommended that Congress adopt a statutory rule of rate-making requiring the Interstate Commerce Commission to be responsible for railroad rates and fares designed to yield the carriers in each designated traffic section not less than 6 per cent net upon the aggregate fair value of the property of the railroads. The statutory rule recommended by the conference provides that it shall be the duty of the commission to authorize or establish rates and fares that will produce, not for each railroad company, but for the railroads in the aggregate in each natural traffic section of the country, aggregate revenue sufficient to yield a net return of not less than 6 per cent upon the aggregate fair value of the property of the railroads devoted to the public service in each of the several traffic sections. It is recommended that "fair value" shall be ascertained by the commission by giving consideration not only to physical property but also to earning power and such elements as may properly receive attention.

The determination of the fair value whether for rate-making or for other purposes, has unavoidable difficulties. When the Interstate Commerce Commission completes the valuation it is making that will, of course, be adopted; but during the next three to five years some temporary method of determining "fair value" must be followed. The recommendation is that, pending the completion of the valuation now being made, the fair value, for rate-making purposes, of the railroads as a whole and by traffic sections, shall be their aggregate property investment accounts; while the fair value of the property of an individual railroad shall temporarily be taken to be that share of the aggregate property investment accounts of all the railroads in the traffic section in which the road is situated which the particular road's annual railway operating income bears to the aggregate railway operating income of the railroads in its traffic section—public authority having power to make equitable adjustments in special cases.

Plan for Strengthening and Stabilizing Railroad Credit

From the rates made in carrying out the foregoing statutory rule, the best situated, or most ably managed, railroads will receive more than 6 per cent net, while the less favorably located or less efficiently managed roads will obtain less than 6 per cent. By the plan adopted by the conference, each of the railroad companies that receive a net return of more than 6 per cent are to be required to put half of the excess into a company contingent fund until that fund shall amount to 6 per cent of the fair value of the company's property, while the other half of the excess is to be turned over to a general railroad contingent fund administered by trustees appointed by government authority and maintained and used for the benefit of all the railroads of the country.

When any railroad company has brought its own contingent fund up to 6 per cent, the company shall increase its annual contribution to the general railroad contingent fund to two-thirds of its net income in excess of 6 per cent, the other third of the excess being retained by the company for distribution among the stockholders or for other lawful purposes. This plan would keep the profits of individual railroad companies within reasonable limits without taking away from the management of the companies the incentive to effort and efficiency.

The purpose of the general railroad contingent fund is to assure to the railroads in the aggregate, by traffic sections, a return of 6 per cent. The fund is to be the means of strengthening and stabilizing railroad credit, and to do this (a) without making the government responsible for a fixed return to individual railroad companies, (b) without imposing unreasonable rates upon the public, and (c) without permitting the railroads that have been unfortunately located or have been over-capitalized or otherwise mismanaged to shift their burdens from their own shoulders onto the government or the public or the other railroads. The general railroad contingent fund, accumulated in the manner indicated, is to be drawn upon by all railroads of a designated traffic section when in any year the net return upon the aggregate fair value of the property of all the railroads in that section falls below 6 per cent., due to the fact that the rates authorized or established by the Interstate Commerce Commission, in consequence of fluctuations in volume of business or of an unexpected increase in expenses, have not yielded the carriers the minimum net return of 6 per cent, provided by the statutory rule of rate making.

As has been explained, the proposed general railroad contingent fund is to be created and maintained by contributions required from such companies as have net returns in excess of 6 per cent, two-thirds of the excess being contributed. The fund is to be drawn upon only when, and to the extent that, the rates and fares, which are controlled by the Interstate Commerce Commission, do not yield the railroads the contemplated annual net return of 6 per cent.

When the general railroad contingent fund is drawn upon for the purpose of bringing the aggregate net revenues of the railroads in any traffic section up to 6 per cent, all of the railroads in the traffic section shall share in the distribution pro rata to their gross earnings. By this plan the weak roads, that will presumably have contributed nothing to the general fund, will receive their share; but they will not be the sole beneficiaries of the distribution. It is not the purpose of the general contingent fund to give to the properties of the weak roads values which they do not possess; its purpose is to assure to the railroads as a whole, year by year, a net return of not less than 6 per cent. upon a fair value of their property; and thus to establish the first condition precedent to stabilizing railroad credit as a whole, and to securing for the public adequate railroad transportation at reasonable capital cost. It is not proposed to provide the weak roads with a net return upon an amount in excess of a fair value of their property.

Consolidation of Railroads Into Strong Competing Systems

The grouping or consolidation of the railroads in the United States, within a reasonable time, into a limited number, possibly 20 to 30, strong competing systems, is essential; because railroad rates must be the same for similar services, whether performed by the weak, necessitous railroad, or by the strong and prosperous one. It is in the interest of the public that railroad charges shall be neither so high as to cause the strong roads to profit unduly, nor so low as to force the weak lines, upon which large sections of the country may be vitally dependent, into bankruptcy or into such a permanently enfeebled condition as to prevent them from serving the public adequately and efficiently. All sections of the country ought in the future to be served by railroad systems managed by companies strong enough to serve the public with progressive efficiency and economy.

It will be necessary for the government to return the railroads to the companies from which they were taken, but the obstacles to the grouping or consolidation of railroads, under conditions approved by the government, should be removed, and provision should be made for bringing all of the railroads in the country within a reasonable time into such a number of strong competing systems as it may be found desirable or necessary to perpetuate in order to secure for each principal district of the country the service of more than

one system. The grouping or consolidation should be about the present strong systems, that is along commercial lines, and not by means of arbitrary territorial sub-divisions of the country.

While presumably it will not be practicable for the government to require the immediate grouping or consolidation of the railroads, voluntary consolidations should be permitted and facilitated. The railroad companies should be called upon to submit, for approval of the government, plans for the grouping or consolidation of the roads, and if the companies do not submit such plans within a reasonable time the government, acting through the appropriate authority, should determine and announce what permanent groupings or consolidations are deemed to be in the public interest. Should the consolidations thus declared to be in the public interest not have been effected, or should they not be well advanced, at the end of a reasonable period, say five years, power should be given the appropriate public authority to carry through the desirable mergers by compulsory proceedings, if in the judgment of Congress such power can be granted, and the public interests will be thereby advanced.

Federalizing Railroad Corporations

As the proposed strong competing railroad systems come into existence by consolidations, approved or required by the government, they should be owned and operated by companies subject as corporations to the jurisdiction of the United States. Congress will presumably provide for permissive federal incorporation of railroads, but it should not stop there. Some effective plan should be devised for changing the allegiance of the railroad corporations from the states to the federal government.

It is argued by some lawyers that the United States cannot compel an existing railroad company to surrender its state charter, take out a federal charter, and transfer its property to the new corporation; but it is also pointed out by others that it is not necessary to adopt this method of converting existing railroad companies from state to federal corporations. It is said to be within the power of Congress to pass an act similar in principle to the national bank act, by which railroad companies may readily transfer their allegiance from the states to the United States.

Either by compulsory federal incorporation, or, if that should not be feasible, in such other manner as Congress may determine, all railroads engaging in interstate commerce should be brought as corporations under the jurisdiction of the United States; but in so doing their powers of local taxation and police regulation should be reserved by the states. By reserving those powers the states will retain the relation to interstate carriers by rail which they should logically possess.

Labor Representatives and Government Directors

It is recognized by everybody that the railroad business is of a public nature. The public is entitled to information regarding the corporate activities of railroad companies, and provision may properly be made for participation by representatives of the government in the deliberations and actions of the directors of railroad companies. Although it may not have been necessary in the past that the public, through the government should be represented upon the directorates of the multitude of railroad corporations, it seems clearly in the public interest that the public shall have a voice in the management of the large and powerful railroad corporations that may be allowed to own and operate the limited number of consolidated systems which it is proposed shall be perpetuated. It is recommended that Congress require these large corporations of the future to organize with a board of 12 directors, 3 of whom shall be selected by appropriate authority of the federal government to represent the principal interests in the several territories served by the different systems.

The public has an especial interest in the maintenance of harmonious relations between the railroads and their employees. There should be mutual understanding and confidence on the part of the employer and the employed. It is believed that this relationship will be greatly promoted by requiring each of the railroad corporations that are to own and operate the large systems contemplated in this plan to include in its directorate one member who shall be a representative of the employees of the system managed by the board and shall be nominated for that position by the employees.

The conference favors the adjustment of wages, hours of labor and other conditions of service of railroad employees by boards consisting of equal numbers of representatives of employees and officers of the railroads, with appeal, in case of the disagreement (deadlock) of an adjustment board, to an appropriate federal authority as referee.

Federal Regulation of Capital Expenditures and Security Issues

Everybody seems to have reached the conclusion that in the future the capital expenditures and the security issues of railroad companies should be regulated by federal authority. The states should be, and apparently are, quite willing to retire from this field of regulation, provided the regulating authorities of the states are officially notified of proposed security issues and afford an opportunity to be heard thereon.

Regulation of Rates By the Interstate Commerce Commission

The Interstate Commerce Commission has performed a task of great magnitude. Its work of regulating rates and of developing and supervising the bureaus connected with rate regulation and railroad valuation has increased steadily until the commission has come to carry a heavy load. It would be unwise to add unnecessarily to its present duties, especially in view of the fact that its responsibilities must unavoidably be increased, should Congress by legislative enactment confer upon the commission such power over intrastate rates, rules and regulations affecting interstate commerce as may constitutionally be granted. It will doubtless be possible, and probably in the public interest, for the Interstate Commerce Commission to enlist the co-operation of existing state commissions in the regulation of intra-state rates affecting interstate commerce.

A Federal Transportation Board—Its Powers

To carry out the plan recommended extensive administrative powers must be vested in some federal agency. Should the commission, as is contemplated, become the authority for the sole regulation of all railroad rates, rules and regulations affecting interstate commerce, its duties will necessarily be enlarged. To require the commission to exercise the administrative functions contemplated in the proposed plan of remedial railroad legislation would be to the detriment of the public interest because it would seriously interfere with the prompt action of the commission as a body for the regulation of rates, the task for which it was especially created and for the performance of which it is peculiarly adapted.

It is recommended that a Federal Transportation Board of five members be established to exercise the administrative functions required for the enforcement of the proposed remedial railroad legislation. The following specific duties should be entrusted to this board:

(a) To pass upon the public necessity for capital expenditures and to regulate the security issues of railroads.

(b) To act as the referee in cases of disagreement (dead-

lock) of a board entrusted with the adjustment of wages, hours of employment and other conditions of the service of railroad employees.

(c) To administer the general railroad contingent fund and to enforce the means and measures that may be provided for strengthening and stabilizing railroad credit.

(d) To determine and announce the grouping or consolidation of railroads deemed to be in the public interest, and to carry out plans authorized by Congress for merging all railroads engaged in interstate commerce into strong, competing systems severally owned and operated by companies subject as corporations to the jurisdiction of the United States.

(e) To promote the development of a national system of rail, water and highway transportation, by providing for the articulation of the railroads with the waterways in a traffic sense, by bringing about the common use and construction of terminal and transfer facilities at the larger centers of traffic, and by such other means as may be found to be practicable and in the public interest.

(f) To inquire into the practices of railroad management and to propose measures for preventing abuses therein.

(g) To appoint the directors that shall represent the government upon the directorates of the proposed consolidated railroad companies.

The board which performs the duties enumerated in the foregoing list will be entrusted with an executive task of the first magnitude. It should be composed of men of the highest character and attainments. It will equal, if not exceed, in importance, the Federal Reserve Board, whose creation was most fortunate and whose services have been of great value to the public. The Federal Transportation Board should be primarily administrative in purpose and organization. It will have the large and exacting task of guiding and facilitating the development of an adequate and efficient national system of transportation.

A Railroad Reserve Fund for Use During the Period of Transition

A severe strain will be placed upon railroad credit and upon the financial stability of the railroads during the period of transition of the railroads from government to corporate operation unless special precautionary measures are adopted. At the present time the railroads are being operated with a large and increasing deficit and it is doubtful whether the deficit can be overcome during the remainder of this calendar year. In all probability many of the railroads now being operated by the government will be showing a deficit at the time they are returned to their owners.

The several railroad companies will resume the operation of their properties under abnormal conditions. Most rolling stock is being used by the railroads as a whole without much regard to individual ownership to some extent terminals are being jointly occupied and used; traffic has been largely rerouted and traffic organizations of the carriers have been to a considerable extent disintegrated. It will take the corporations some little time to readjust themselves to the new conditions and it is evident that the government will need to assist the carriers financially until they can get going.

It has been suggested by the Hon. Charles A. Prouty that "the government should guarantee for one year (after turning the railroads over to their owners) a return equal to 75 per cent of the contract compensation in all cases where contracts have been executed. And the carrier should be required to pay over to the government in all such cases 75 per cent of any excess which it may make over and above the contract compensation." If this suggestion were adopted the government would guarantee to pay the railroad companies during the first year of private operation 75 per cent of over $900,000,000, and would have little assurance that the sums which might be advanced would ever be returned to the government.

Recognizing that it will probably be necessary for the government to assist the carriers temporarily during the first few years of corporate operation while the railroad companies are building up their individual contingent funds and while a start is being made in establishing the general railroad contingent fund, the Transportation Conference recommends that Congress make an appropriation loaning $500,000,000 for the creation of a railroad reserve fund to be administered by the Federal Transportation Board. It is recommended that the board be required to invest the sum thus loaned in United States bonds or notes, the interest on the securities to be paid annually into the United States Treasury. The fund which is to be established for the purpose of bringing about the prompt stabilization of railroad credit and of facilitating such consolidation of railroads as the board shall decide to be in the public interest, may be used as follows:

The reserve fund created by Congressional loan may at any time during the first 10 years after the enactment of the proposed legislation, be drawn upon to whatever extent may be necessary to enable the trustees of the general railroad contingent found to pay over to the railroads the sums which they may be entitled to draw in accordance wih the provisions conrolling the distribution of money from the general contingent fund. The plan provides, however, that any sum advanced by the Federal Transportation Board to the trustees of the general railroad contingent fund shall be repaid to the board with interest as soon as the general railroad contingent rund shall reach, and be maintained at, the amount of $500,000,000. In other words, after the general railroad contingent fund shall, from the contributions received from the railroads, have reached $500,000,000 the first claim upon the fund will be the repayment to the government of the amount loaned at the time of the transition of the roads from the government to corporate operation.

Finally it is recommended that the Federal Transportation Board or the War Finance Corporation (the act creating that corporation having been appropriately amended) be authorized to advance public funds (under terms that will ensure the government against loss) to certain individual roads whose credit and financial operations it may be necessary, in the public interest, temporarily to protect during the transition to normal stable conditions.

Commissioner Clark's Testimony

That the provisions of the Esch-Pomerene bill, which would enlarge the powers of the commission over car service and operation and authorizing it to require joint use of transportation facilities in time of emergency, while freeing the railroads from some restrictions, would enable the commission to deal adequately with any emergency of transportation likely to arise in time of peace or war or at least to take care of the situation as well as possible with the available facilities, was the opinion expressed by Commissioner E. E. Clark in his testimony before the committee on July 17. Mr. Clark opposed the fundamental features of the principal plans for dealing with the railroad problem that have been suggested by other bodies, such as a requirement that rates should be made to produce a certain percentage of return, a guarantee of earnings, a secretary of transportation or a reorganization of the roads into a few companies by consolidation. He declared that if the provisions of the bill advocated by the commission had been in effect in 1917 there would have been no necessity for the federal control act or for the financial legislation that has followed it, and moreover that some of the embarrassments that have resulted from federal control might have been avoided.

Mr. Clark believes in compulsory mergers of operating facilities but he does not believe the government can compel

consolidations of companies. He hoped that a great deal of consolidation would be carried out under the permissive provisions of the bill, which would take care to some extent of the weak lines. He thought there are many cases where the companies would be glad to enter into mergers if they were given the right to do so.

He had not been able to satisfy himself that there is any necessity for federal incorporation. Congress, whenever it chooses to do so, can occupy the entire field and there will be no need for federal incorporation. The railroads cannot be consolidated into a few systems, except by laying a foundation for voluntary action; if compulsory consolidation were attempted the carriers would be very much "up in the air" for several years during the litigation of conflicting interests that would inevitably follow. Regional commissions would be impracticable, for regions could not be established without cutting across traffic territories and transportation systems. Transcontinental rates could not be fixed on a regional basis.

He objected to the plan of a secretary of transportation. One individual would have no better or sounder view than a tribunal whose membership changes gradually. A cabinet officer would probably change every four years or oftener.

To require the commission to establish rates which would produce a given percentage of return would put the commission up against an impossible situation; no man can figure out a level of rates which will produce a given percentage. No man can foresee the volume of traffic and there is a point beyond which an increase in rates will reduce it. A guarantee of earnings is fallacious for the net income is largely dependent upon expenses which are in the control of the carriers: the public could not be protected against improvident and perhaps extravagant expenditures for maintenance. Any government guarantee takes away to some extent the incentive to economy.

E. E. Clark

To put upon the Interstate Commerce Commission the responsibility for regulating wages would be both unwise and impracticable. The commission could not decide either a rate or a wage question without reference to the other. The commission, holding this view, is not influenced by the fear of unpopularity because "it has enjoyed some of that as it is." Regulation of wages ought to be put in the hands of a tribunal that would deal with wages on their own merits and the Interstate Commerce Commission should deal with freight and passenger rates in the light of what was done about wages.

Mr. Clark introduced again the financial statements he had presented to the Senate committee, which he thought demonstrated that the credit of the carriers had not been destroyed by niggardly regulation. He showed that while the length of railroad in receivers' hands had increased to 37,353 miles on June 30, 1916, it had been reduced to 17,366 on December 31, 1917, and he declared that certainly rate levels or regulation had absolutely nothing to do with the receiverships of the Rock Island, the Frisco, the Missouri Pacific, the Denver & Rio Grande, the Western Pacific, the Wabash, Pittsburgh Terminal, the Pere Marquette or the Cincinnati, Hamilton & Dayton.

In discussing the return of the railroads to private management, Mr. Clark said that it would undoubtedly be necessary for the government to lend them some aid and he suggested a loan, on adequate security, at a rate of interest below what could be secured in the open market. The government should pay as a war cost the large losses resulting from war operation. There should be some declaration by Congress as to the rate situation because the state rates will inevitably go back to where they were, in the case of statutory rates, and probably also in the case of rates made by state commissions. Replying to a question, he saw no prospect of any increase in traffic sufficiently to wipe out the present deficits. He assumed that wages could not be reduced and said that under the new conditions of employment established by the government he did not believe the number of employees could be reduced sufficiently to affect the situation materially.

It would be most advisable, Mr. Clark declared, for Congress to enact some temporary legislation which will stabilize the rate situation during a period of months, possibly a year, after the railroads are returned, so as to prevent reductions of intrastate rates; and traffic officers of individual roads should be restrained from cutting rates upon the resumption of competition; there should be some agency by which rates should be passed upon in each ditrict. The commission might appoint committees, composed of experienced traffic men of a judicial temperament, with possibly some representatives of the shippers.

In reply to questions by Chairman Esch as to the effect of various provisions of the bill, Mr. Clark said that while it preserves the right of the shipper to route his freight, that power could bet set aside by the commission in an emergency. The requirement of a certificate by the commission for the construction of new lines would help to stabilize railway securities but existing lines ought to be required to fully develop their own fields. He mentioned the competitive construction of lines down the Des Chutes canyon in Oregon by the Hill and Harriman lines, after the former had once declared the territory not worth building into, and the construction of the Western Pacific, as examples of lines whose building might be prevented.

Replying to a question by Mr. Esch the commissioner thought that there must be an abundance of capital seeking investment but "the railroad executives and financial interests have kept on saying, in season and out of season, since 1910, that they had no credit," so what can they expect?

Mr. Clark elaborated on the increased powers conferred by the bill to enable the commission to deal more adequately with water traffic, and also on the increased powers for dealing with such rate situations as those of the Shreveport rate

case, involving state discrimination against interstate commerce. The "Shreveport situations" are on the increase but the proposed powers would contribute largely to their reduction.

The power to prescribe divisions of rates as between carriers should make it possible to see that the short lines get a fair division, but he would not go so far as to say that they would all be enabled to live. In the course of a discussion as to meeting water competition he said that if the railroads were prevented from doing so the water lines would put the rates as high as possible. The opportunity to grant fourth section relief to the circuitous rail lines is really of more importance than the question of competition with water lines.

In reply to questions by Representative Sims regarding the effect of the bill on the weak lines, Mr. Clark said that if the provisions for supervising security issues had been in effect the "weak sisters" would not be so weak. Some companies must inevitably undergo reorganization under any circumstances. Some roads are weak because they never should have been built, some because they had not been so well managed as their competitors and some because of financial manipulation.

The commissioner said that the bill under discussion had been proposed merely as amendments to the act to regulate commerce; the return of the roads to their owners and stabilization of the rate situation should be covered by a separate measure. The roads should be returned to their owners just as soon as Congress can enact proper legislation. In reply to Mr. Sims, he said that the fifteenth section amendment, requiring the permission of the commission before an increased rate can be filed, is an unwise restriction. New tariffs are likely to be so numerous that the commission could not handle them except in the most stereotyped way.

Representative Cooper asked why no provision for dealing with labor disputes had been included in the bill. Mr. Clark said that wages ought to be dealt with by some other body than that which regulates rates. He did not propose to discuss the question of whether wages ought to be regulated, saying that he had great faith in the possibilities of mediation, conciliation and arbitration; but that a separate tribunal should be charged with administering whatever policy Congress lays down.

Replying to a question by Representative Dennison, Mr. Clark disapproved subsidies and guaranties. "If the railroads cannot be made self-supporting without a government subsidy the government had better take them and see what it can do."

Mr. Clark said that he hoped that one of the results of the bill if enacted would be the organization of joint terminal companies like that of the Terminal Railroad Association of St. Louis. He thought that all of the terminals of an industrial community should be in the hands either of the municipality or of a separate corporation like that at St. Louis. Competition would not be affected in any way, he said.

Mr. Clark's testimony and cross-examination were completed on Tuesday and he was followed by Mr. Wheeler.

Compulsory Federal Incorporation

By Alexander W. Smith

The legal aspects of federal incorporation were discussed by Mr. Smith, who said in part:

Opinions of learned counsel of the National Association of Owners of Railroad Securities have been widely circulated by that association declaring that there is no constitutional method for the creation of federal railroad corporations and compelling transfer to them of their existing properties without the consent of their stockholders, or of the states creating them, and thus forcing abdication of their corporate obligations and duties under their state charters. When we consider that this proposition rests on the premise that separate and distinct federal corporations are to be created and that they are to take over by transfer, either through negotiation or condemnation, the assets of the existing railroad companies, the legal conclusion of the eminent lawyers who have furnished or endorsed these opinions is unquestionably sound.

The country is confronted, however, with the absolute necessity of the federal government being vested with full jurisdiction of interstate carriers *in their corporate functions* in addition to the constitutional jurisdiction now exercised by Congress over the activities of these carriers in connection with interstate commerce. Unless this is accomplished, the proposition that the government shall authorize the consolidation of these existing carriers into large systems which will necessarily interfere with competition in local territory becomes a legal impossibility, because it will run counter to constitutional inhibitions in a large number of states prohibiting such consolidations by the corporations they have severally created.

Aside from the insuperable legal difficulty thus indicated, it is a wholly impracticable thing to transfer and transplant the assets and liabilities of the existing corporations engaged in interstate commerce into new corporations created for the purpose. Take the Southern Railway Company as a concrete example. It is a system made up of more than one hundred separate railroad corporations. It owns some of them; it controls others under long leases, and others by majority stockholding. It has effected their merger by all the known methods of putting one railroad under the operative control of another. Their obligations, under the kaleidoscopic arrangements it has made in bringing the system together, could not be transformed and lifted out of the several state corporations and set down in a new federal corporation.

It is respectfully submitted, however, that the problem is not insoluble, for there lies on the surface a method to accomplish the desired results in a perfectly simple way, viz.: The passage by Congress of a general federal incorporation act along lines parallel to the laws incorporating national banks and nationalizing state banks. This is the basic idea of the recommendation of the conference on this subject, and the idea has been developed in the draft of the remedial railroad law, which will be presented by the representatives of this conference.

If Congress should adopt this bill existing railroad companies engaged in interstate commerce and operating under state charters could take out certificates of incorporation, to be issued as therein provided, under which they would become federal, or national, corporations without destroying their corporate identity and existence; without changing their officers and stockholders; and without disturbing the title to their assets or the integrity of their existing liabilities; and the continuity of their business would not be interrupted.

The authorities conclusively establish that such a proceeding results in a mere transition and not a new creation, and does not destroy previous identity or corporate existence, and simply results in a continuation of the same body, with the same officers and stockholders, the same property, assets and business under a changed jurisdiction. Any interstate railroad thus nationalized would remain one and the same railroad, and would go on doing business uninterruptedly, under existing liabilities and contractual privileges and obligations.

Since no one questions the power of Congress to incorporate interstate railroads, it follows that it can authorize the conversion of such a railroad company from a state corporation into a national corporation. While Congress has no power to compel a state bank to become a national bank, because a state bank is no part of the fiscal machinery of the Nation, it is submitted that it does have the power to compel

a railroad system that is now engaged in interstate commerce to become a federal corporation.

The power of Congress to create a bank at all was contested until it was settled by the Supreme Court that said power was implicit in the power delegated to Congress to issue money and handle its finances. Jurisdiction of Congress over a railroad engaged in interstate commerce is delegated in a specific, plain, explicit, all-inclusive, and plenary paragraph of the Constitution committing to it control over interstate commerce and all its instrumentalities.

If it be true that Congress has only implied power to charter a bank as a piece of machinery in its fiscal system, it must be true that if Congress finds in the development of transportation that state lines have been wiped out, and that commerce disregards artificial obstructions, and that necessary machinery in carrying on interstate commerce is a railroad corporation, the express grant of exclusive jurisdiction over such commerce carries with it the power to create such a corporation.

If that is true, can it compel a state railroad company engaged in interstate commerce to become a federal corporation? No one questions its power to create such corporations, ab initio.

It has been decided by the Supreme Court of the United States that no single state can create a railroad company and endow it, as a matter of law, with the right to operate its lines in any other state. Indiana and Ohio tried to do this conjointly. They created two railroad companies, each endowed with the same name and having the same officers, directors and stockholders. The tracks owned by these two companies came together at the state line. Every effort was made to create a single corporation with the right to do business in states. The Supreme Court held that there were two separate and distinct corporations and that, in the very nature of the case, one state could not give the power to its creature to go into the domain of another sovereignty of equal dignity and do business there, except by permission of the other state. Hence it is that all roads that cross state lines do business outside their native state by comity between the states. Comity is a privilege merely and not a legal right.

The Southern Railway Company was able to merge its constituent lines running through 11 states by reason of the voluntary, but not necessary concurrent, action of the several states and their corporate creatures. First, the states either by special acts or by general laws gave statutory permission for the railroad corporations to combine. Second, all constitutent corporations had to take appropriate corporate action through stockholders and directors according to by-laws and charter provisions, authorizing the particular step necessary to a merger. So that each of the constituent corporations was put into the combination by virtue of its own action taken by permission of its creator. Thus, by virtue of the express consent of the several corporations and of the express legislative sanction of the 11 states in which the Southern Railway system operates, something was created different from the aggregate of corporate powers previously vested in the subsidiary companies. The Virginia corporation known as the Southern Railway Company became an instrumentality of interstate commerce, not by virtue of comity, among these 11 states, but because it crosses the lines of said states and hauls interstate commerce through them as a single entity and by virtue of the action of each of the states, and of the concurrent or supplemental action of the owners of each of the properties. *Whether they intended it or not, it is a fact that every one of those states, and every one of those corporations, by such action, voluntcrily submitted themselves to the jurisdiction of Congress through its exclusive control of interstate commerce, whenever it sees fit to act.*

Congress has never exercised that power, but with all due respect to the eminent counsel who have raised legal objection to compulsory federal incorporation, no satisfactory reply has yet been made to the legal conclusion involved, viz., that Congress has the power, if it chooses to exercise it, to say that every system of railroads engaged in interstate commerce by virtue of consolidating constituent lines (and no other such system can legally exist unless originally created by Congress): "You are now an instrumentality of interstate commerce, and in the development of the commerce of this country it has become necessary that full jurisdiction of your functions shall be vested in the federal government. Therefore, you are required to transfer your allegiance from the state of your incorporation to the United States of America, in order that the federal government may take such steps hereafter in the control of your business and in the promotion of the interests of interstate commerce as from time to time it sees fit. Congress could then establish consistent control of all sytems of interstate carriers.

If federal incorporation is made permissive only it is questionable whether Congress will not be embarrassed by some of the lines declining to accept federal charters. Many of them have tax exemptions and special charter privileges which they would hesitate to imperil. Voluntary action would certainly destroy these privileges, while, under compulsory action, these property rights might be preserved under other provisions of the Constitution not necessary to be here elaborated.

It should be repeated that this argument is confined to those lines which, by voluntary action, have been consolidated into interstate systems. They have thereby waived the right (if it exists) to object to Congress doing anything with them that it may desire to do if they expect to continue in interstate commerce.

As to the necessity of federal incorporation, there does not seem to be any room for argument. If the federal government is to vise and control the issuance of railroad securities, upon what principle, without the voluntary cooperation of the state corporation, can Congress interfere with its issue of stocks and bonds expressly authorized under its state charter? They may be not necessarily connected with its interstate commerce. Their proceeds may be needed for other purposes. Many railroad corporations engage in business other than transportation. The exercise of control over the securities of a state corporation by Congress is much harder to justify under existing law than the power to compel federal incorporation by interstate systems. The basis of the securities, especially the original issues, is the charter of the constituent companies, and not of the holding or operating company. Rights in these are vested and protected by the federal Constitution itself. But when the corporation operating the interstate system is compelled to transfer its allegiance to the federal government, subsequent issues of its capital stock and bonds may be regulated as Congress directs.

The contractual relation between a state and its corporate creature presents no obstacles to compulsory federal incorporation of interstate systems hereinbefore described, because the state has consented in advance that that may happen. When the state gave permission to its corporation to become a part of the instrumentalities of interstate commerce by virtue of its legal merger into an interstate system, it relinquished its right to object to any sort of control over that corporation which Congress might choose to exercise. Of course, until Congress exercises control the allegiance of the corporation remains with the state that created it. The argument is that both the states and the corporations, by virtue of the necessities of the consolidation that produced the interstate system, have contracted in advance that Congress may exercise jurisdiction over this legally established

instrumentality of interstate commerce if, in its discretion, such action will promote the interests of interstate commerce. Such jurisdiction has been exercised in numberless ways. *If, without destroying the corporation itself,* it may be converted from a state corporation to a federal corporation, there is no legal reason why Congress may not constitutionally require it to make the change.

Judge Smith's statement aroused a great deal of interest among members of the committee, several of whom are strongly opposed to the idea of federal incorporation, and a desire was expressed to cross-examine him at length, but he was obliged to leave the city at once and promised to return later when it would be possible for him to testify as to the text of a bill being drafted to carry out the provisions of the conference plan. Representative Dennison was particularly interested in the effect of federal incorporation on the provision of the Illinois Central charter providing for a state tax on the basis of a percentage of its gross earnings in lieu of all other state taxes, which he said, was an advantage to the state. Judge Smith had said that railroads would retain the benefits of their charter provisions, but said that if the state tax constituted a burden on interstate commerce the state would have to give it up, although, he said, the conference assumed that the constitutional protection of any property rights would continue to function. Representative De Walt thought a peculiar situation would be created if both the federal government and the states had tax powers. Mr. Smith pointed out that railroads are now subject to both state and federal taxation, but he said that under the proposed plan the state's right of taxation would be somewhat limited by the power of Congress which could prevent it taxing railroad property except on the same basis as the taxation of other property. Representative Sanders asked what could be accomplished under federal incorporation which could not be done without it. Mr. Smith said he had grave doubts as to how the Interstate Commerce Commission could regulate the stock and bond issues of state corporations without it and that it would be necessary to carry out the provisions of the conference plan. He said the greatest benefit would be to get the railroads out from under the irreconcilable regulation of 48 state commissions. Representative Sanders thought it somewhat inconsistent to say that Congress could not regulate security issues, but to say it has the power to compel federal incorporation.

Paul M. Warburg followed Mr. Smith. His remarks will be published in next week's issue of the *Railway Age.*

Proposed Rule on Rate Making

By W. W. Salmon

W. W. Salmon, president of the General Railway Signal Company, and chairman of the Railway Business Association's Committee on Railways After the War, followed Mr. Warburg and introduced a number of charts illustrating the effect of the proposed rule of rate-making. Mr. Salmon said in part:

It was felt that amongst the things essential to restoration and maintenance of railway credit, two of the most important are, first, an authoritative governmental declaration as to what shall be deemed a reasonable minimum rate of net earning upon the aggregate value of railroad properties devoted to public service and, second, a recognition and assumption by the government—which regulates the rates and, in large degree, determines the expenditures of the railroads—of its obligation in fixing rates to so fix them that they shall produce revenues adequate to yield the declared reasonable minimum rate of net earning upon the aggregate value of the railroad properties devoted to public service.

In discussing what might be regarded as a reasonable minimum, attention was strongly directed to the facts that in the three years ended June 30, 1917 (hereafter referred to as the test period), the aggregate net earnings from operations of all of the Class 1 railroads of the United States were approximately 895 millions of dollars, or approximately 5.2 per cent upon their aggregate property investment accounts amounting to 17,192 millions of dollars; that during this period of relatively good average earning, the railroads were unable to secure needed funds on such terms as would warrant the emission of their securities for equipment, improvements and extensions required in the public interest—though industrials were at the same time able to sell their securities on favorable terms, by which it is meant that the funds procured from the sale of such securities would earn, in industry, a profit over and above the interest charges thereon. The conference discussion developed the fact that, in its opinion, the net earnings from railroad operation during the test period were insufficient to attract the capital that must be had if the railroads are to be organized and equipped to adequately serve the needs of the country and that they would continue insufficient unless increased in an amount at least equaling the difference between 5.2 per cent and 6 per cent on the aggregate property investment accounts.

It is the view of the conference that while the railroads as a whole must earn from operations an average aggregate annual net return of not less than 6 per cent upon the aggregate fair values of their properties devoted to the public service, if they are to be able to command the capital required for their needed development, there will doubtless be in the future, as now, substantial differences between the rates of net return of the several railroads. Therefore, in this recommendation the railroads of the country are referred to in the aggregate in each of the traffic sections designated by federal authority and it is the belief of the conference that in this, as in its further recommendations, nothing will be found that will cause lessening of zeal on the part of any railroad officer or employee to so conduct the affairs entrusted to him that his railroad may properly earn the greatest possible share of the aggregate net return of the group of railroads of which his is a part, for the conference recognizes that any rule which has such an effect inevitably decreases the efficiency and increases the cost of service to the public.

The conference discussed at length the elements that should properly be considered in arriving at a determination of the fair value of railroad property and, recognizing that a considerable time must of necessity elapse before such value can be ascertained for all of the railroads of the country, sought to find a basis of valuation which, pending an authoritative, permanent fair valuation, may serve as a fairly satisfactory temporary basis in establishing rates. It reached the conclusion that while doubtless the fair value of the property of certain railroads will be found to be much less than the amount shown by their property investment accounts, the reverse will be found to be true of many other large systems which in the past charged to operating expense large sums which, under the existing accounting rules prescribed by the Interstate Commerce Commission, would have been charged and are properly chargeable to capital account. It is the belief of the conference, based upon a comparison of the book valuation of our railroads as a whole, with that of the railroads of other countries, where labor was much cheaper, that it will be found when the federal valuations are completed that the aggregate property investment accounts of all the railroads of the United States and in each of the existing traffic districts or sections amount to less rather than more than the federal valuations will show.

It is the belief of the conference that while a great majority of the people of the United States should and will ap-

prove of a rule of rate making designed, in their interest, to yield a minimum aggregate net return adequate to attract private capital in quantities sufficient to enable the railroads of the country to economically furnish the facilities required to meet the needs of our great and constantly increasing commerce, there should and would be a vigorous protest against any rule, the effect of which is deemed likely to unduly increase the earnings of railroads whose earnings in the past are quite generally believed to have been ample. The conference therefore consideed most carefully what could be done to satisfy this most natural and reasonable view, it being quite certain that if the average net return of all of the railroads of the United States should, in consequence of the proposed rule of rate making, increase from the 5.2 per cent of the test period to 6 per cent per annum on their aggregate property investment accounts, certain railroads, whose earnings in the test period were greatly in excess of 6 per cent, would have a substantial increase over their earnings in the test period and that, so far as they alone are concerned, neither the conference nor the country at large would deem it necessary to fix rates designed to obtain a greater yield than that of the test period.

The conference is of the opinion that all income in excess of 6 per cent per annum upon the fair value of the railroad property devoted to the public service should be regarded as "excess income."

It is an exceedingly simple matter to understand how excess income will be determined when the federal valuation of the railroads shall have been completed since any and all earning over 6 per cent on the ascertained valuation of any individual railroad system will constitute excess income. But the conference formula and provisos for ascertaining excess income, pending completion of the federal valuation, are not equally simple and, for clarification, the following illustrations are cited:

The amount of the average aggregate property investment accounts of the 32 Class 1 railroads of the Southern district for the three-year period ending June 30, 1917, was $2,589,615,640; the average aggregate railway operating income of all these railroads for the same period was $138,820,918. For the same period the average railway operating income of the Tennessee Central was $163,753, equal to 0.11815 per cent, of the aggregate like income of all the railroads of the Southern district. Under the conference formula, the temporary valuation of the Tennessee Central, for the purpose of ascertaining excess income, equals 0.11815 per cent of $2,589,615,640, or equals $3,058,341, instead of the $19,717,592 shown as the average amount of its property investment accounts in the period named. All of its net railway operating income over 6 per cent per annum on this $3,058,341 valuation, or over $183,500, would constitute excess income, unless in the test period its average annual railway operating income exceeded $183,500 and as such was not the case in the test period, any income in excess of $183,500 would actually constitute excess income.

Take another and extremely different illustration, that of the Norfolk & Western. Its average net income from operations for the test period were $20,893,498, equal to 15.05132 per cent of the aggregate of such earnings for all of the railroads of the Southern district during that period. Under the conference formula the temporary valuation derived for that road would be 15.05132 per cent of the aggregate property investment accounts of all of the railroads of the district, or $389,771,475; but, under proviso 1, this derived valuation cannot be used, since it exceeds the amount of the average property investment account of the railroad, which was $264,792,196. On the other hand, 6 per cent upon this last named amount would be only $15,887,532, and as this is less than its average net railway operating income for the test period, amounting to $20,893,498, only income exceeding this latter amount is regarded as excess income.

The effect of proviso 2 is thus seen to be that whereas, pending the completion of the federal valuation of railroad property, no net railway operating income not in excess of the average of the test period shall be regarded as excess income, all railway operating income in excess of such average is treated as excess income when earned by a railroad that earned 6 per cent or more on its property investment account during the test period. The purpose of this provision is that no such railway, whose earnings during the test period were 6 per cent or over, shall even temporarily unduly profit from its increase of earning, growing out of the operation of the proposed rule of rate making.

Upon a careful review of the various plans suggested as to the disposition to be made of excess income, it was the opinion of the conference that it should be used wholly or in major part to establish and maintain certain railroad contingent funds. It is obvious that no matter how honestly and ably the governmental rate fixing agency shall perform its task, there will inevitably be years when, for one or another uncontrollable cause, net railway operating income will fall below the desired and requisite percentage. It was therefore deemed wise that out of its excess earnings each railroad should contribute a part to the establishment of its own individual railroad contingent fund, upon which it may draw in any year when its net railway operating income shall fall below 6 per cent of the fair value of its property; and that it shall also contribute a part to a general railroad contingent fund which can be drawn upon only when the aggregate net operating income of all of the railroads of a traffic section falls below 6 per cent upon the aggreate property investment accounts of the railroads of that traffic section. In this way all earnings from railway operations are available for the maintenance of the credit of the railways.

In the tables are shown the estimated contributions of each of the Class 1 railroads in each traffic section to each of the contingent funds in a year when the aggregate net railway operating income of the railroads of each traffic section equals 6 per cent upon the average aggregate property investment accounts of the test period.

These contributions in such a year, while the individual contingent funds are in process of creation, and prior to the effecting of the consolidation of existing roads into a limited number of competing systems, are estimated as follows:

District	Individual contingent fund	General contingent fund	Total
Eastern	$13,676,562	$13,676,563	$27,353,125
Southern	4,881,539	4,881,539	9,763,078
Western	19,765,944	19,765,944	39,531,888
Totals	$38,324,045	$38,324,046	$76,648,091

Upon the completion and maintenance of all the individual railroad contingent funds, contributions thereto would cease and thereafter, in a year of 6 per cent railway net operating income upon the aggregate property investment accounts the aggregate contributions to the general railroad contingent fund are estimated as follows:

Eastern District	$18,235,413
Southern District	6,508,719
Western District	26,354,589
	$51,098,721

While the aggregate of contributions to the contingent funds, as above shown, are substantial and will serve greatly in the needed establishment and maintenance of railroad credit, it was realized by the conference, that upon the consolidation of existing railways into such limited number of competing systems as may be deemed by the transportation board to be in the public interest, there will of necessity be a great reduction in the amount of such contributions for the reason that as the railroads which have a large rate of net railway operating income and are the chief contributors to the contingent funds, are merged with lines of much smaller earning, there will be greatly reduced excess earnings, out of which contributions can be made.

An Unusual Form of Roundhouse Smoke Jack

New Pittsburgh & Lake Erie Structure at Haselton Also Embodies Other Unique Features

SMOKE JACKS that cover the entire length of the stalls, a special form of door construction and a reinforced gypsum roof are features in a recently completed roundhouse of the Pittsburgh & Lake Erie at Haselton, Ohio, which make this terminal one of unusual interest to students of engine house facilities. Some of the ideas embodied in this design were applied previously in a roundhouse of this road at Dickerson Run, so while these features are new to most railway men, they bear the stamp of actual service and the form in which they have been applied in the engine terminal at Haselton embodies such modifications as were considered advisable after the experience at Dickerson Run.

The most radical feature in the Haselton house is the continuous smoke jack which may be said to constitute an elaboration of the modern tendency toward smoke jacks having a broad spread in the direction parallel to the track in the stall. Most roads have found it of great convenience to have jacks with elongated hoods so that the stack on the locomotive will be covered for a variation in location of some eight feet or more to allow for a considerable latitude in the position of the drive wheels on the track. However, jacks so designed do not offer any facilities for the collection of steam escaping from the engine at some distance behind the smoke stack or for smoke emitted from the stack while the engine is entering or leaving the house, and it has been found that considerable of the smoke nuisance in roundhouses results from an engine backing out of the house with a green fire. Studies for the elimination of the smoke thus emitted resulted in the special form of jack used in these roundhouses.

This decision was influenced largely by the fact that the officers of the Pittsburgh & Lake Erie have been advocates of the use of structural steel construction in roundhouses for some time, notwithstanding the fact that the practice on a number of other railroads has positively prohibited the use of rolled metal of any kind in roundhouse construction. Proper attention to painting and special efforts to eliminate smoke and secure ventilation in the roundhouses has demonstrated the successful use of structural steel on the Pittsburgh & Lake Erie. The special smoke jack construction evolved is in a certain sense the result of further efforts to improve conditions for the use of steel in these structures.

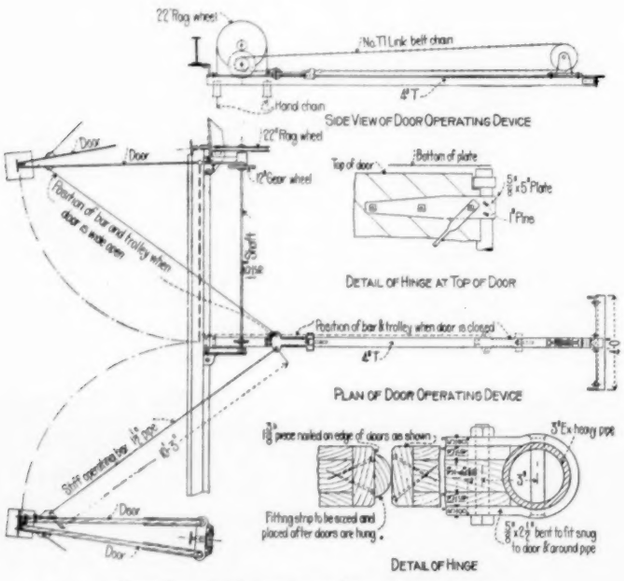
As shown in the drawings the smoke jacks in the Haselton roundhouse are continuous from the doors to within a few feet of the outer wall of the house, there being three outlets through the roof. Except for the one-inch rods by which the jacks are suspended from the roof and a few other rods serving as horizontal ties, the entire jack construction is of wood, using one-inch sheathing on 2 in. by 4 in., 4 in. by 6 in., and 4 in. by 8 in. wales. Experience in the Dickerson Run roundhouse shows that there is little fire hazard if the design is such that there is little opportunity for the accumulation of soot.

Interior of the Roundhouse, Showing Continuous Jack Construction

The successful elimination of the smoke collected by the long hood of the jacks implies ample vent area through the roof, which to avoid unnecessary heat loss in winter time must be closed by dampers when not in use. The unique design of door adopted may be said to result largely through the simple fact that jack C, i. e., the one nearest the door, is of use only at times when the door is open. In other words, the damper in this jack needs to be open only when the door is. Consideration of this fact led to the design of an operating device that opens and closes the damper of jack C with the opening and closing of the door.

This device is shown in the longitudinal section of the roundhouse stall and in the large scale detail. Each pair of doors is held open or closed and is swung to the open or

closed position by a pair of operating bars which are attached by one end to the outer ends of the doors near the top and by their other ends to a "trolley" that slides on a T-iron placed horizontally on the center line of the track over the door. This trolley is attached to a continuous No. 77 Link Belt chain run over two sprocket wheels so that the movement of the chain over the sprocket slides the

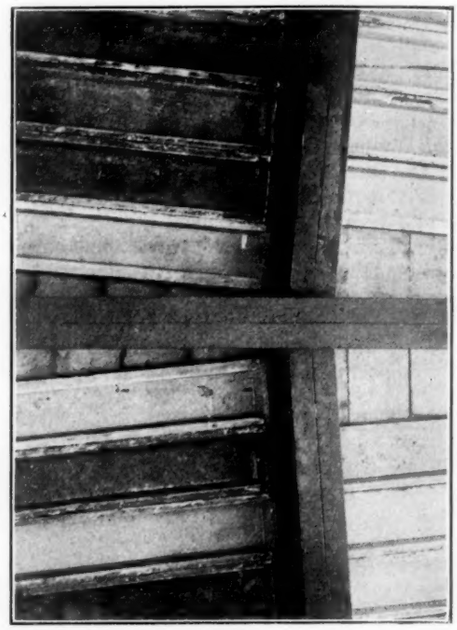


Details of Door-Opening Arrangement

trolley one way or the other and in turn swings the two doors in or out. The power for this movement is supplied by a hand chain hanging from a rag wheel attached to the door post and connected to the sprocket wheel over the door by means of a train of gears. The jack damper is operated by the link motion shown which consists of a Y-frame attached to the damper and a stiff rod attached to the trolley chain. The dampers of the other two jacks in each stall are controlled by hand chains attached to nearby posts and except in severe weather are normally left open.

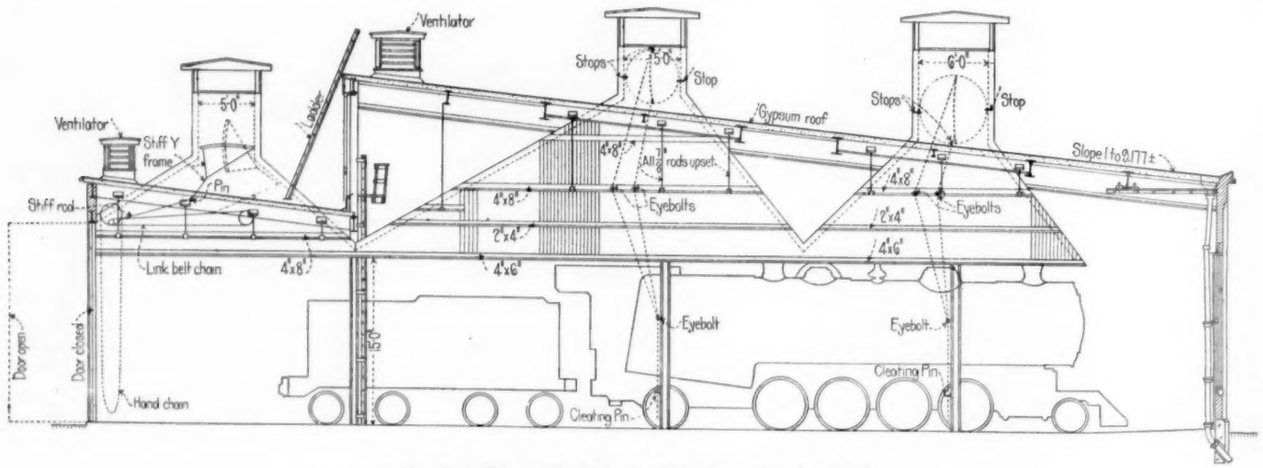
Other features of the roundhouse doors are of interest. The doors have no hinges but swing on three-inch extra-heavy pipe securely attached to the backs of the doors by heavy steel straps and turning in sockets at the top and bottom of the door frames. Owing to the fact that the two doors of each pair are opened and closed simultaneously, the meeting joint is not provided with a weatherstrip, but is equipped instead with a rubber contact as shown in the drawing.

The gypsum roof construction above referred to consists of pre-cast slabs of reinforced gypsum set on the steel purlins of the roof frame. These purlins run circumferentially,



Underside of Roof Construction, Showing Manner of Assembling Gypsum Slabs at the Junction of Two Stalls

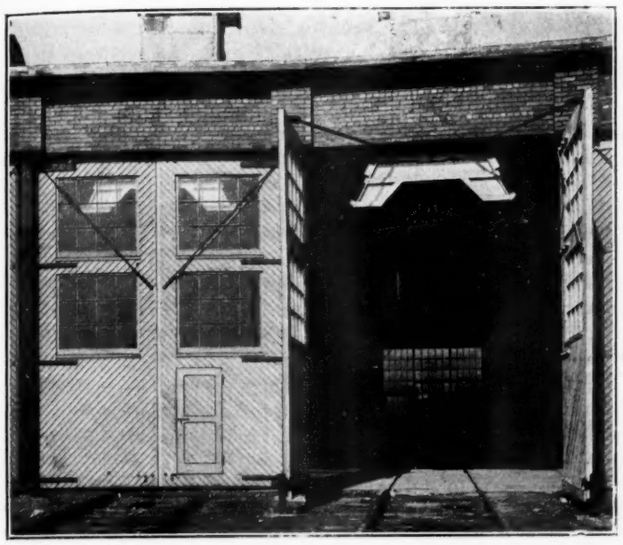
spanning between the girders on the center lines between stalls, these lines of purlins being equally spaced (about 8 ft. 9 in.) The gypsum units are placed in an approximately radial position spanning from purlin to purlin, the uniform spacing of the latter permitting the use of a large number of units of standard width and span while the wedge shaped openings on the center lines between stalls were closed by short pieces of slab spanning circumferentially and cut to fit on the job. This arrangement is readily understood by an examination of the photographs. The standard gypsum units are of a channel section placed with the flanges down. The units adjoining the center line between stalls have a special heavy flange and a recess or seat to receive the special slabs that are used to fill out the wedge-shaped open-



Section Through House, Showing Smoke Jack

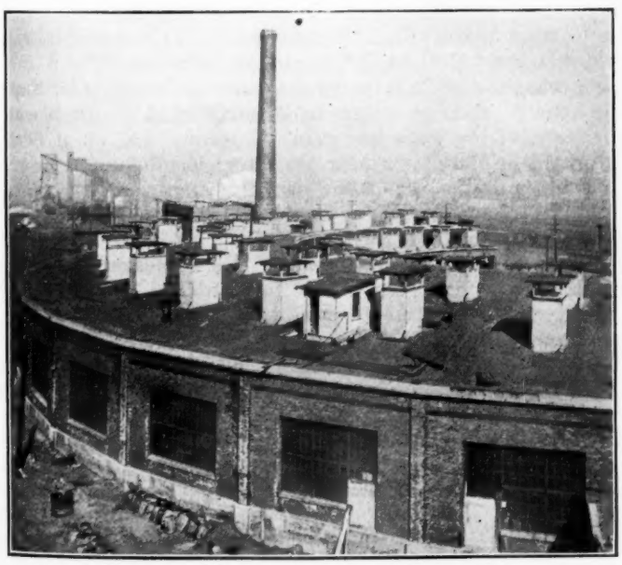
ings. These special slabs are of a plain flat construction and were readily cut to fit the odd size openings. All irregularities in joints in this construction were plastered with fresh gypsum.

The reasons given for adopting this form of construction are of interest. Other types of roof considered were timber



Track Doors Opened and Closed

and concrete. As this work was in progress during the war period, heart timber was not available and sap wood untreated was considered out of the question because it would require early renewal, not only of the roof timbers but also of the high grade roofing which it was desired to install. As a consequence timber construction implied the use of cre-



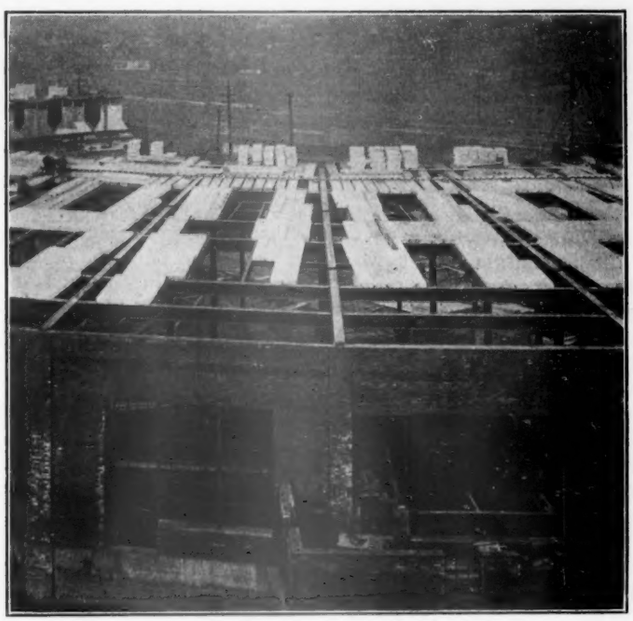
Exterior View Showing the Multiple Vents for the Smoke Jacks

osoted material and comparative estimates showed that the gypsum would be cheaper than the treated wood while the necessity for winter work led to the rejection of the concrete design. The gypsum was supplied pre-cast by the United States Gypsum Company, Chicago, with specifications requiring the gypsum units furnished to withstand an ultimate load of not less than 200 lb. per sq. ft. Tests made on stock specimens both dry and saturated fulfilled these requirements.

Other details of this roundhouse deserve special mention. The floor is of concrete; the portion between adjoining engine pits being pitched from a level coincident with that of the top of the rail near each ends of the engine pits to a level of the base of the rail half way between, where slots in the tops of the engine pits wall afforded drainage from the floor into the engine pits.

Special pains were taken to secure good natural illumination in the roundhouse, taking into consideration the points on the engine where the light is most needed, that is near the front end and inside of the cab. General illumination is afforded by a large area of windows in the outer wall of the house and also in the doors while the roof construction is so arranged as to provide a large area of windows in a position that will illuminate the cab.

The service pipes are carried around the house overhead, being suspended from hangers that permit their swinging in or out with changes in length resulting from changes in temperature. This system includes pipes for hot water, cold



How the Gypsum Roof Slabs Were Placed

water, steam and blow off in addition to a high pressure water system for testing boilers. Pipes for the first four named are connected with a manifold on the outer wall at the rear of each stall from which a service pipe is carried in a conduit to a service connection attached to a column between the stalls. A line from the high pressure water system is also carried to a similar service connection, but is kept separate from the other service pipes because it is not economical to provide and maintain valves in the manifold to withstand the high pressures carried on the boiler testing system.

The house has 24 stalls, this being the net number required for actual roundhouse service for the locomotives. Ample track space for storing engines has been provided outside of the house and a shop with space for five locomotives has been designed to be built adjoining the roundhouse for doing light running repairs. This roundhouse was designed and built under the direction of J. A. Atwood, chief engineer of the Pittsburgh & Lake Erie, and A. R. Raymer, assistant chief engineer, both with headquarters at Pittsburgh, Pa.

Some Chapters in Canadian Government Ownership

Prince Edward Island's Burdensome Railway, Which Never in Any Year Earned Its Operating Expenses

By Harold G. Villard

II

(In the first article in this series Mr. Villard told of Nova Scotia's costly experience in building and operating its Provincial Railway. In his next article Mr. Villard will show what degree of success Ontario has had with its government-owned Temiskaming & Northern Ontario road.—Editor.)

PREVIOUS to 1871 not a mile of railway had been built in the then still independent colony of Prince Edward Island. The Provincial legislature, which met in the spring of that year, had been elected after a close contest in which the subject of a government-owned railway had not even been mentioned. Nevertheless, although the people had had no chance to express their opinion upon such an important proposition, the government caused the House of Assembly to pass a resolution on April 3 approving of the construction under government auspices of a first-class railway through the Island.

Two days later, and without affording the members from the country districts an opportunity of consulting their constituents in regard to its terms, the government jammed a bill[1] through the same Lower Chamber authorizing the building of a provincial railway between certain designated terminal points. While the railway was to be of the first class, the statute directed that no construction contract should be entered into "conditioned for the payment of any greater sum than £5,000[2] per mile" of completed road, including all station grounds and equipment. It also prescribed as "an indispensable condition in construction contracts" that contractors would have to pledge themselves to accept in payment for the work to be performed by them "at par, without any allowance for discount" provincial debentures, payable 30 years after date and bearing 6 per cent. interest.

Thus in this precipitate fashion and without any urgent public demand therefor was Prince Edward Island committed to the construction of a main trunk line to cost when in complete working order not more than $16,200 per mile. As this was the maximum expenditure allowed, it was evident that—although the surface of the island is comparatively level and presents no especial difficulties in the way of railway construction—only a very inexpensive road could be built for the sum named. Hence the first move of the government was to determine on a narrow gage of 3 feet and 6 in. for the railway, which necessitated less deep cuttings and allowed the use of shorter and more frequent curves than if the customary broad gage of 4 ft. 8 1-2 in. had been insisted upon.

Having rushed through their railway legislation[3], the government lost no time in proceeding with the construction of the railway. The authorities were determined to have work on it started before the winter set in. Already on May 23, therefore, and before the first surveying party had been put in the field, advertisements were inserted in British, American and Canadian papers inviting tenders for the construction and equipment of a narrow gage railway between Casumpec and Georgetown, "a distance of about one hundred and twenty miles." On September 11 a construction contract was actually entered into with a Canadian firm for the completion of the line. To it were attached certain schedules specifying the amount of excavation, ballasting, etc., which the contractors would have to perform. All these schedules were left blank, but the contract naively recited that they "will be filled up as soon as the location of the line is approved."[4] Indeed, it was not until November 21 that the final location of the entire line was officially sanctioned by the cabinet as required by the terms of the Railway Act.[5] This action of the ministry in entering into a construction contract before the route, which the road was to follow, had been definitely determined upon, cannot be termed a very businesslike procedure.

Preliminary to agreeing on the line of the railway, the administration appointed a committee of nine legislators from each section of the Island "to attend in their respective counties with the government engineer to advise with him and arrange as to the location of the road."[6]

Passed as Many Places as Possible

This body proceeded on the theory that the main trunk line ought to pass through as many places as possible if it were to be of the greatest utility to the people of the province. Hence, instead of adhering to the plan originally proposed, of running direct between Charlottetown and Summerside by way of Freetown and the Hunter Valley, the road was deflected at the instance of a member of this advisory committee to a place called "Kensington." This detour alone added a great deal to the length of the railway "and the same was the case in bringing it to other points in order that the country at large might be accommodated."[7] In place, therefore, of the main line being 120 miles long as at first estimated by the government, its actual length proved to be over 148 miles, or nearly one-fourth greater.

Besides being made unnecessarily long through this desire "to accommodate the greatest number," the course of the road was necessarily circuitous. For, unless the contour of the ground had been closely followed and all expensive cuttings avoided as far as possible, the line could not have been completed for £5,000 as prescribed in the Railway Act. In after years, the railway was not inaptly described as "a twisting, winding, wriggling road" and at one point was facetiously said to have "so many curves that it passed at almost every man's door." In many cases, the degree of curvature was so great that it was almost unsafe to travel on the road. The following citation gives an instance of this kind:

> "The bridge across the Medgil stream is placed on a curve of a radius of 600 ft., and is approached from the east by a gradient of 58 ft. per mile, or 1 in 91, and from the west by 66 ft. per mile, or 1 in 80, thus forming a most dangerous feature in the railway. It will be necessary, for safety, to bring the trains to a stand before passing on to this structure in either direction."[8]

Nor was the character of construction changed when the

[1] Chapter 4, Laws of 1871.
[2] Equivalent to $16,222.22.
[3] The Railway act became a law on April 17, 1871.
[4] See Prince Edward Island Journals, 1872, App. L. for terms of contract.
[5] Prince Edward Island Journals, 1872, Appendix S.
[6] Ibid. ibid.
[7] Hon. Mr. Pope—Prince Edward Island House of Assembly Debates 1873, p. 67.
[8] Report of Engineer Swinyard—Quoted in Prince Edward Island House of Assembly Debates, 1875, p. 255.

branch lines came to be built. When the Conservatives failed to obtain a majority at the next election following the passage of their railway legislation, they were succeeded by a coalition administration pledged to the construction of fifty miles of branch lines. The new ministry had the good sense to avoid one of the mistakes made in contracting for the building of the main line in advance of surveys by providing that the proposed additional mileage should "be surveyed and located previously to the letting of the contract"[9] for its construction. Nevertheless, as the cost of these branch lines was likewise limited to £5,000 a mile, they had to be built with the same steep grades and short curves which were used on the main line.

In addition to determining the route to be followed, the government which fathered the construction of the railway undertook to decide the position and location of all the stations along the line. In some instances, these sites were selected not from the standpoint of the public interest, but in accordance with the wishes of the administration's most influential supporters. Thus at Summerside six acres were purchased for railway station purposes on the outskirts of the place from an adherent of the government. When the succeeding administration assumed office in 1872, therefore, it obtained authority from the Legislature to change station sites already chosen.[10] Where such changes were thereafter effected, as at Summerside and Allberton, they were made at the expense of the friends of the late government. Just as in the case of that government, however, the incoming administration was not always happy in its selection of a terminal site. For example, the station at Souris—where the Island Railway terminated in a sand pit instead of being completed through to tide-water—"was built where it was totally inaccessible" and in "the most unsuitable place imaginable."[11]

Land Damages Vastly Exceed Estimate

At the time the railway was first projected, the leader of the then Government announced that the right-of-way for the main line would cost less than $35,000.[12] This speedily proved an underestimate and by March 31, 1875, the sum expended for land damages had reached a total of $253,738.86.[13] Where a landowner was dissatisfied—as was generally the case—with the award of the government commissioners, he had the right to appeal to a Board of Appraisers. These appraisers usually found that the land condemned had been undervalued, which in a great measure accounts for the large increase in the right-of-way costs over the amount first estimated. "In every case that was referred to the late appraisers for their decision, they awarded a larger amount than had been allowed by the late railway commissioners."[14]

As has been mentioned before, the construction of the Island Railway was begun in the fall of 1871. A year or so later, one of the principal local banks was imprudent enough to make a loan far beyond its available resources secured by the Provincial debentures issued to the contractors for the railway in payment for work performed by them. The directors of this bank were "curiously intermingled with the public men of the day." When it developed that the debentures thus pledged could not be realized upon except at a heavy loss, these leading citizens saw a chance of averting such a calamity by joining Confederation. They were instrumental in bringing about a union with the rest of Canada, for the people—aware by this time that the railway would prove a burden—preferred "Confederation as a lesser evil than the grinding taxation which would result from the construction of the railroad."[15] Thus, as the direct consequence of its hasty railway legislation, Prince Edward Island—whose House of Assembly had only three years previously passed a resolution reciting "that the people were almost unanimously opposed to any change in the constitution of the colony"—ceased to exist as an independent Province and on July 1, 1873, became a part of the Dominion of Canada.

"Worst Built Road in America"

Besides entitling the Province to charge up against the Dominion a fictitious indebtedness or subsidy of fifty dollars per head of its population, the terms of Union provided that "the railways under contract and in course of construction for the Government of the Island" should become the property of Canada. For the better carrying out of this provision, it was agreed that the cost of the railway should be borne by the federal government and the amount so paid should be regarded as a debt against the Island and as an offset to the subsidy which the Dominion was obligated to pay. When the road attained completion, therefore, in the fall of 1874, it was turned over to the Dominion officials. These speedily discovered that the Provincial Railway was—to use their own expression—"not of a faultless character." The Prime Minister later described it as "perhaps the worst built road ever seen in America,"[16] for which condition of affairs he blamed the Island Government. Exception was taken to the location of the railway which had been determined "independent of any question of directness of route or of grade."[17] The rolling stock was unfitted for the work it was called upon to perform and the engines were of inadequate power. The roadbed was insufficiently ballasted and could not be drained properly, while the masonry was of a poor quality.

In addition to all these defects, the fencing along the line was of a most inferior description. In December, 1871, the island ministers—although in the words of one of their number they all "had then no experience of wire fences"[18]—directed that a system of iron wire fencing should be substituted for the post and board fence which the railway contractors had first been instructed to erect. No sooner had the wire fence been completed, however, than it proved "totally unsuited for the purposes for which it was designed." Equally ineffective against cattle, horses, sheep and hogs, it was carried all over the island by the live stock which ventured to cross the track. At length in 1875, its replacement was decided upon by the Dominion authorities after one of their engineers had reported that "nothing short of an entire change in its character will be effective, a change that will entail an expenditure of not less than from $300 to $400 per mile of railway."[19] The ill-advised action of the local government in insisting on this untried kind of fencing proved therefore a very costly blunder.

Expenses Greatly Exceed Earnings

When the building of the railway was first undertaken in 1871, the government predicted that its yearly gross earnings upon the completion of the main line would be $200,000. Instead of any figures like this being attained, however, the total earnings of both the main line and branches for the first fiscal year 1875-1876[20] amounted only to $118,060.90. Both passenger and freight traffic turned out to be disappointingly small. If the gross earnings fell far short of anticipations, the expenses on the other hand ex-

[9]Chapter 13, Laws of 1872.
[10]Sec. 9, Chapter 13, Laws of 1872.
[11]Prime Minister Mackenzie—Canadian Hansard, 1878, p. 2432.
[12]Prince Edward Island House of Assembly Debates, 1872, p. 192.
[13]Prince Edward Island Journals, 1875, Appendix N.
[14]Hon. Mr. Davies—Prince Edward Island House of Assembly Debates, 1873, p. 113.
[15]Mr. Palmer—Quoted in Prince Edward Island House of Assembly Debates, 1872, at page 220.
[16]Hon. Alexander Mackenzie, Canadian Hansard, 1880, p. 1709.
[17]See Dominion Sessional Papers, 1877, No. 6 at pp. 64 and 127, for this and the following strictures.
[18]Hon. Mr. Brackin—Canadian Hansard, 1880, p. 1711.
[19]Mr. F. Shanly—Dom. Sess. Papers, 1876, No. 66, p. 3.
[20]The railway was first opened for traffic on May 12, 1875.

ceeded all estimates and totalled no less than $214,930.43, or the equivalent of 182 per cent of the gross earnings.

This unusually high ratio of operating expenses, which has remained a feature of the railway down to the present time, was the natural outcome of the faulty construction of the railway by the local politicians who had it in charge. As we have seen, their primary object was to build a cheap railway and one not to exceed $16,200 per mile. This necessitated the laying out of a crooked line with steep curves of short radii. The fact was overlooked apparently that a road of this character must be necessarily expensive to operate and that—even if its first cost had been greater—a good and substantial railway would have been the truest economy in the long run. It is well known that the sharper the curves on a railway,[21] the greater will be the resistance offered to the impelling power with a consequent higher consumption of fuel by a locomotive in overcoming such resistence. Aside from causing an increased amount of wear and tear on rails and flanges and enhancing maintenance outlays, short and frequent curves prevent further any great rate of speed being attained.

Again, in locating the Prince Edward Island Railway, the idea was to furnish as many places as possible with a railway connection even though it resulted in increasing the length of the line. That there is an economy in straightness of route was lost sight of. Where a railway possesses a mileage of needless length, not only do passengers and freight have to be transported over the unnecessary distance for all time to come, but the additional cost in fuel, wages, wear and tear of rolling stock and for the maintenance of the permanent way as compared with a direct line must be taken into consideration. If the Provincial authorities had only taken the following doctrine to heart, the Island railway would have been much less of a losing proposition during the last forty years: "A line ought not to diverge from the direct course between its extremities, and thus increase its distance for the sake of a trade of a small town, for whose benefit the time and fare of all the passengers and freight on the whole line would thus be taxed. It would be preferable to make a branch line to the town."[22]

While the operating expenses were thus unusually high, low rates were charged for the meager traffic which passed over the line. In order to compete successfully with the small coasting vessels which frequented the numerous harbors along the coast and which had hitherto carried on the trade of the island, the railway freight rates were necessarily kept at a low figure. Instead of trying to bring up the earnings of the road by charging comparatively stiff rates for passenger traffic where no competition was to be feared, however, the railway officials were not long in reducing the scale of passenger fares put into force at the opening of the line. This resulted in a decline in passenger receipts, which was mainly ascribable to "the lowering of fares by the introduction of 2nd-class tickets and the issue of return tickets at reduced fares to all stations, both flag and regular, which without increasing the number of passengers materially lessened the amount of revenue."[23]

Unbroken Series of Deficits

Just as at the outset, the Prince Edward Island Railway has been noted throughout its career for high operating costs and scanty earnings. As the road from the time it was first opened has never paid expenses, the federal government has had to make good its unbroken series of deficits which in the forty years 1875-1915 reached a total of $2,453,494.20.[24] At the end of the same period, the railway's capital account had grown to $9,490,899.71, all of which has been furnished by the Dominion taxpayers without their ever receiving a cent of return.

Since the road built and operated under Government direction has not merely proven an unproductive investment from the start but has been a losing proposition as well, it was a fortunate thing for the local taxpayers that the Dominion government was saddled with the upkeep of this incubus of a railway as one of the terms of the Island's entering Confederation. This undeniable truth was succinctly stated by an Island statesman in the following words: "If the railway were not a burden upon our resources as at first contemplated by its projectors, it would be a curse to the country. It is lucky for the country that the Dominion government has agreed to run the road and bear the expense of maintaining it."[25]

[21]The rule reads the resistance due to curvature is in inverse proportion to the radius of the curve.
[22]W. M. Gillespie—Roads and Railroads, p. 270.
[23]Report of Railway Sup. McKechnie—Dom. Sess. Papers, 1878, No. 7, App. p. 122.
[24]Dom. Sess. Papers, 1916, No. 20, p. 50.
[25]Hon. Mr. Davies—Prince Edward Island House of Assembly Debates, 1876, page 14.

Photo from Underwood & Underwood

Hauling Freight on Electric Railways

The Southern Pacific has electrified much of its mileage in Southern California and electric locomotives are used on these lines for hauling freight.

Transport Bill Passed by House of Commons

Will Place Nearly All Transportation Facilities in United Kingdom Under Control of One Man

By Robert E. Thayer
European Editor of the *Railway Age*

LONDON, July 12, 1919.

On July 10, the British Transport Bill, which aims to put in the hands of a single man, the control of all transport facilities in England including railways, light railways, tramways, canals, waterways, inland navigation, roads, bridges, ferrys, harbors, docks and piers, was passed by the House of Commons without substantial modification from the original draft as presented late in February. This bill was strongly backed by the government, which made every effort to put it through. Bonar Law, the home secretary, stated that the sole purpose of the bill is to help re-establish the industry of the country after the war, by means of the best and most comprehensive system of transportation.

While the bill was in Standing Committee the government was disposed to push it through as it stood, but with the signing of peace the only bond which has held the coalition cabinet so firmly has been removed and the government has found it desirable to be more conciliatory. Thus when 24 representatives of the important docks and harbors brought pressure to bear on the government to remove them from the direct jurisdiction of the transport minister, the government felt it necessary to grant their demands, with the proviso that the transport minister may require the owners of docks to make improvements or alterations in the method of working, as may be prescribed for the co-ordination of transport facilities, and that they may appeal in case they feel such orders are injurious to them to the Lord Chief Justice of England.

A change was also made with regard to the control of highways. The authority of the transport minister was somewhat restricted by the adoption of a Road Committee, which shall consist of not less than ten members, five of whom are to be representative of highway authorities and five of the users of road traffic, all of which are to be appointed by the transport minister, after consultation with such authorities.

These two amendments were insisted upon by the representatives of the respective interests, both for the purpose of limiting the possibilities of nationalization as much as possible, and because they have a feeling, on account of the personnel of the transport ministry, that its administration will favor the railways more than any other transport system. In fact statements were made that the railway men backed the transport bill for the purpose of enabling them to get back into shape.

The bill does not yet seem to satisfy the people here that it is not leading directly to the nationalization of England's transport facilities. The matter received the greatest consideration during the recent discussion in the House. Attempts were made to introduce amendments to the bill, to the effect that during the two years the government retained control of the transport facilities, no steps would be taken which would lead towards nationalization. This was done for the purpose of making the government state definitely that it was not seeking this end. The government strongly fought any such amendment with a statement that it was impossible to state whether the question of nationalization would or would not be affected by the bill, but it could be said that the government would not use the powers given it by the bill either for or against nationalization. Sir Eric Geddes said that the question of nationalization was as open as ever it was, and that the government was requesting the control of the transport facilities for two years for the purpose of determining upon the best policy to follow in the future. In fact he said that the situation required either the passage of the bill or nationalization. In this he was sustained by Bonar Law, the home secretary. However, it is rather difficult to imagine how a successful two years of operation of roads by the government would not present a most strong case for nationalization. There can be no question but that the government thinks it can operate the transport facilities of the country successfully for otherwise it would not attempt it.

One curious thing in the whole procedure is the lack of any concerted action by the railways against the bill. It is difficult to find a railroad man that is in favor of nationalization. They all do, however, realize the difficulties they will have to contend with due to present poor physical condition of the roads, and the greatly increased cost of operation. It has been estimated that the cost of operating the roads for the year ending March 31, 1920, will be about $500,000,000 more than in the year 1913, of which $300,000,000 will have to be borne by the state, the balance being made up by increased revenue, this increase being divided somewhat as follows: War wages and other concessions, $280,000,000; the eight hour day and other new concessions recently granted or still under discussion, $90,000,000, and extra cost of materials and coal, $130,000,000. It is believed that the possibility of increasing freight rates (they have not been increased throughout the war although passenger fares were increased 50 per cent) under private management would be much more difficult than under government control, and it is hard to see how the increase in expenses can be met in any other way. The minister designate, however, aims to decrease expenses by eliminating competition in traffic, the common use of equipment (about one-half the freight cars or 700,000 are privately owned), judicious electrification, improved loading, larger freight cars and standardization of cars and locomotives.

The bill provides that the rates established by the government can be held in effect by the roads 18 months after the expiration of the two year control, provided, of course, roads are turned back to their private owners. This also attracts railway men to the bill. The railway stockholders are also well satisfied for they at least will receive their dividends and in event of nationalization they are well protected by existing laws. Thus many of those on the railroad side feel that the transport bill is the easiest way out of the difficulty. In this case the responsibility of rehabilitation and improvement of service, which is so badly needed here, is placed directly on the state. Furthermore, the railways will be strongly represented in the personnel of the transport ministry, for Sir Eric Geddes is a railway man and five of the seven principal assistants to serve under him are professional railway officers.

The attitude of the Labor Party in the House also gives the impression that it believes the bill will ultimately result in nationalization. Labor takes the stand that "the exigencies of the war has made the nationalization of railways, mines and all the key industries of the land inevitable," and believes that the government could not trust private enterprise, without central control, to develop transport in such a way

as to meet the problems of today. It will act with the government on this bill when it works towards nationalization. The policy of the labor leaders is to sit tight, and only fight when the supreme control over transport facilities is menaced. This was well illustrated by their opposition to the amendment introduced which removed the direct control of docks and harbors from the jurisdiction of the transport minister. Labor fought this amendment hard, for it operated against its desire for supreme government control and nationalization. Labor members in the House characterized this action of the government as a "humiliating climb down."

There has been but little concerted action taken against the bill, although fears are expressed everywhere of the fact that it leads to nationalization. At a recent meeting of the Association of British Chambers of Commerce, however, the President of the Association stated that while the above mentioned modifications took some of the sting out of the measure, they did not remove the danger of the bill towards the principle of nationalization, and the adoption of this principle would mean the death blow to individual enterprises.

The newspapers have been quite strong in their condemnation of the bill. The *London Times,* in an editorial published July 3, stated "That their criticism of the bill is based on two main convictions, first, that the bill is not practical, and that its chief result will be eventually to create a vast and costly bureaucracy which, in its turn, may bring about chaos. The second is, that this is a bill framed not to meet the situation, but to fit the ambitions of a single man whose qualifications are questionable, to say the least." The bill does, without question, place a vast amount of power in the hands of one man, and if he be not well qualified to handle the work, great damage can be done. Furthermore, the bill seems to be framed to meet ideas of the minister designate, and the discussion of it in the House has brought forth many promises or statements of confidence from Sir Eric Geddes, which has done much to smooth over many apprehensions. But the fact remains, that after this bill becomes a law, it is so broad in its powers, much damage could be done, if through any reason whatsoever Sir Eric, with his verbal promises and thorough confidence with the House, should be replaced by another man.

The *London Post,* in commenting on the "open mind" of the government regarding nationalization, says: "Surely ministers must hold some opinion on the subject; some among the members of the government at least must believe either that the nationalization of industry is a good thing for the country or a bad thing for the country. But Sir Eric Geddes says they have no views of any sort. In that case they are unfit for their office. No government is justified in keeping silence in respect of a question which is arousing the greatest apprehension throughout the country." In fact there are many who believe that the bill is entirely a failure, because it has not squarely faced the issue of nationalization.

While two months ago, the feeling prevailed that it was only a matter of time before the transport bill would become a law, there was a feeling along towards the last, in some quarters, that there was still much work to be done before it is adopted by Parliament. The question of nationalization is not all settled, and there is a subconscious feeling that if this bill becomes a law, nationalization would be the natural result two years hence.

The bill passed the House of Commons on July 10 and is now to be considered by the House of Lords.

The Telegraph Companies of the United States, according to a report from the Bureau of Census, covering data gathered in 1917, operate 241,012 miles of pole line, comprising 1,888,793 miles of wire. They sent 151,725,228 messages and employed 47,227 persons.

Pennsylvania Women's Uniforms

THE PENNSYLVANIA RAILROAD, Eastern Lines, has adopted, and prescribed for use by its female employees, three uniform suits of clothes, one for each of the three different general classes of women employees. The "work uniform," indicated by "A" in the illustration, is a one-piece dark blue dress with white collar and silver "PRR" buttons, and a dark blue straw sailor hat. This is to be worn by messengers, janitresses, station attendants, maids, stewardesses, gang leaders, elevator attendants, crossing watchwomen and cup tenders (women who go through occupied trains in stations picking up papers, etc.)

The first three uniforms will be supplied to employees at half price and renewals at full price. The first hat will be furnished free of charge, while renewals will have to be paid for at full price.

The "womanalls" (B) are made of khaki. The complete uniform calls for a cap or a hat to match. They are to be worn by lamp room attendants, store room attendants, tool room attendants, crane operators, hammer operators, helpers of all kinds, laborers, machinists, machine hands, oilers, painters, shop hands, sweepers, turntable operators, car cleaners and

Pennsylvania Railroad Uniforms

A—Work Uniform. B—"Womanalls." C—Norfolk Suit.

car repairwomen. The first three of these uniforms, including a hat or cap, will be furnished to employees at half price and renewals at full price.

The uniform for those women employees who regularly have intercourse with the public (C) consists of a dark blue serge Norfolk jacket suit with regulation shirt waist, dark blue silk tie and dark blue straw sailor hat. This is to be worn by Bureau of Information attendants, matrons, elevator operators, gatewomen, baggage room attendants, messengers, Pullman space distributors, ticket sellers and ushers. The Norfolk suit will be supplied to employees at a discount of 15 per cent. The first hat will be furnished free and the first five shirt waists will be furnished at half price. Renewals of hats and shirt waists will be at full price.

For summer use, messengers and ushers will be given their choice between the dark blue one-piece dress or the serge Norfolk suit. In order to have uniformity, however, throughout a division or department, or at division headquarters, this choice will have to be determined by the majority of employees of such division or department.

Mechanical Stoking of Locomotives an Economy*

Factors Determining Necessity of Applying Stokers; Operating Results Secured by Stoker Firing

By W. S. Bartholomew
President, Locomotive Stoker Company

THE FIRING OF MODERN LOCOMOTIVES by mechanical means could properly be separated into four distinct subjects: First, the stokers themselves; second, the locomotives to which they are applied; third, the particular reasons which lead up to any given application, and fourth, the results which were achieved by such application. I assume that you are familiar with all of the stokers which are now being applied to locomotives and shall begin with the second subject.

All locomotives do not require stokers. Locomotives that can be hand-fired to maximum capacity through sustained periods do not require stokers. Locomotives which are of such size as to come within the specifications of those which are regularly being equipped with stokers, but which are not operated beyond the limits of hand-firing, do not need stokers. These statements must lead to the conclusion that only locomotives which are of such size as to bring them regularly beyond the limits of hand-firing, or locomotives of smaller size but which are regularly operated beyond the limits of hand-firing, require stokers. This must mean that we do not need stokers to do a hand-firing job and that the stoker job cannot be done by hand. This means also that stoker-firing and hand-firing are not directly comparable. Up to the present time, no locomotives have been equipped with stokers which do not need them.

Locomotives Which Require Stokers

These statements must bring up immediately the question as to whether such a definite line can be drawn between locomotives which do not need stokers and those to which they could be applied to advantage. To show you that a definite line can be drawn as to locomotives which can be hand-fired through sustained periods and those which cannot, my own convictions are that no locomotive really requires a stoker that does not weigh approximately 200,000-lb. on drivers, have a calculated tractive power of 50,000-lb or over, a grate area of 60 sq. ft. or over, and a coal consumption through sustained periods of 4,000 lbs. or more per hour.

The commercial application of Mechanical Stokers to locomotives really began in 1910. One of the first important stoker applications was made to five very large locomotives which were designed and built originally to be equipped with stokers. This is especially significant in that, in the main practically all stoker applications have been made to date to locomotives without requiring any general modification in the conventional locomotive design. This application was made on a Chicago, Burlington & Quincy M-2 Santa Fe type locomotive which included in its original specifications such details of design as would permit the application of the Barnum under-feed stoker.

The particular point of interest about this locomotive is that in designing such a locomotive it was realized that to put it in service with a tractive effort of about 72,500 lb., a weight on drivers of over 300,000 lb., and with a grate area of 88 sq. ft. would call for a coal consumption beyond the possibilities of hand-firing.

Five of these locomotives were built in the year 1911 and equipped with stokers, which later proved inadequate in capacity for the requirements and were removed, and the locomotives were put in service in such districts as would permit them to be hand-fired. It was found, however, that they could be hand-fired only by reducing the grate area about 25 per cent by blocking off with fire-brick. These circumstances plainly indicate that on such a locomotive a differential is immediately established between hand-firing, and stoker-firing of at least 25 per cent in capacity. A very gratifying development of this particular situation has been that other stokers were later applied to these locomotives with such success that 60 more have been purchased.

The decision reached by the Burlington as to necessity for a stoker on a Santa Fe type locomotive of this size has practically set the pattern for all such locomotives of this type built. During the past five years over 95 per cent of all Santa Fe type locomotives built for coal-burning service have been equipped with mechanical stokers.

Stokers Increase Capacity of Locomotives

Another very early important stoker installation beginning in 1912 was made by the Norfolk & Western on a large number of Mallet locomotives. This installation probably represents the most marked increase in revenue tons per train that has been accomplished by any stoker installation made so far. To make a concrete illustration the tonnage rating for the 12-wheel locomotives in service on the Norfolk & Western between Portsmouth, Ohio, and Columbus, which were standard for that division before the advent of the Mallet locomotives was 3,000 tons per train for one Class M-2 12-wheel locomotive, or 6,000 tons for a double-header, whereas when the Mallets were tried out and rated on that division it was found that one of these locomotives could haul 6,000 tons between those two points in practically the same time that one of the smaller locomotives could haul 3,000 tons or two of them could haul 6,000 tons.

It was also discovered that the coal consumption of one of the Mallets was approximately one and one-half times one of the 12-wheelers, which, with twice the tonnage, would make an immediate saving of 25 per cent in coal consumption for any given number of total gross tons per mile.

There is current gossip to the effect that the application of stokers to locomotives means more coal consumption, which, of course, it does from one point of view, as one of the main purposes of the stoker is to make it possible to burn more coal per locomotive mile or per locomotive hour than would be possible by hand-firing. The benefits, however, from such increased coal consumption are such as to make the proposition attractive from every point of view as "movement of tons per day" over any given piece of track is the most important consideration in railroad operation. You only need to refer to the annual reports of the Norfolk and Western for the past five or six years to see what has been accomplished in this direction through the use of larger locomotives equipped with stokers.

The stoker fired H-2 and H-4 Mallet locomotives on the Chesapeake & Ohio have accomplished very similar results in increased tons per train and the use of over 300 such Mallets in freight service is a further tribute to the value of the mechanical stoker in the assistance it renders in putting

*Abstract of a paper presented before the Western Railway Club.

into service such locomotives which regularly are operated with a coal consumption beyond the limits of hand-firing.

It is not a question of the pounds of water evaporated per pound of coal altogether, although these particular locomotives show an evaporation, stoker-fired, that comes well within the limits of anything that is regularly accomplished on smaller hand-fired locomotives which are operated anywhere near maximum capacity.

Early Installation of Stokers

About the time these Mallets were put in service on the Chesapeake and Ohio 50 heavy Mikados with a tractive effort of approximately 60,000 lbs. were purchased and have now been successfully stoker-fired for over six years. There has been established a differential of 25 per cent between hand-fired and stoker-fired tonnage rating on the division where these locomotives are operated. The rating between Russell, Kentucky, and Silver Grove, is 6,000 tons stoker-fired and 4,800 tons hand-fired.

Another very early and important stoker installation was made by the Virginian on somewhat larger Mallet locomotives. These early stoker installations had to do with coal traffic, which, of course, is a low-grade commodity from a freight revenue point of view and the earnings are in more direct relation to the tons per train than is the case with other traffic. The operation of these locomotives in the coal traffic on the Virginian has been so successful that special track, special cars, special coal-handling devices at the docks and still larger locomotives have been built to make it possible to increase the gross tons per train still further.

The specifications for the stokers for the Virginian 2-10-10-2 Mallets called for an ultimate coal-delivering capacity of 15,000 lb. per hour as a possibility, and in actual service it is not unusual to have a coal consumption of five tons every 60 min.

The locomotives referred to thus far have all had a calculated tractive effort of more than 60,000 lb. However, a Baltimore & Ohio Mikado which has a calculated tractive effort of only 54,000 lb. represents the largest installation of mechanical stokers to any one type of locomotives up to the present time. The Baltimore & Ohio has over 400 of one design stoker-fired and this locomotive really established the point where the Railroad Administration began the application of stokers to the standard locomotives.

This locomotive not only represents a very important early stoker application as to number of locomotives equipped, there having been 50 of these locomotives equipped as early as 1911, but it also represents definitely the point at which we believe the application of stokers should begin to both new and old locomotives.

Stokers Prove Advantageous on Small Locomotives

The reason which led the Baltimore & Ohio to apply stokers to such a large number of these locomotives as early as 1911 had largely to do with the fact that the bridges, track, and sidings on the Baltimore & Ohio were such that a locomotive with a heavier axle load than 55,000 lb. could not be operated at many points on the Baltimore & Ohio system. The traffic conditions, however, especially between Cumberland, Md., and Martinsburg, W. Va., which is the throat of the system between the Lines East and Lines West, were such as to require a maximum tonnage movement for long periods of the year to avoid congestion.

At the time the first 50 of these locomotives were put in service on the Cumberland Division 48 maximum tonnage eastbound drag freight trains were operated daily. It will be immediately appreciated that both time and maximum tonnage per train were of immense importance under such stress of traffic conditions. Immediately upon putting into service the stoker-fired Mikados referred to on this division, where a large number of duplicate locomotives were already in operation hand-fired, the operating department began to load down the stoker-fired locomotives with heavier tonnage than the hand-fired until within six months after they were put in operation more than 500 tons per train were regularly added to the stoker-fired locomotives over and above the tonnage given to the same locomotives hand-fired.

The Baltimore & Ohio at this time owned 160 of these locomotives without stokers and 50 stoker-fired. Since then they have purchased over 300 of these locomotives equipped with stokers which are now in daily service over all parts of the system.

To haul the traffic under the conditions just outlined between Cumberland, Maryland, and Martinsburg, W. Va., an average coal consumption per hour of 6,500 lb. was not unusual for the entire running time between division points, which will readily explain why the stokers have been so successful on the Baltimore & Ohio even on this comparatively small power. When the United States Railroad Administration came to place orders for a large number of locomotives, which included over 600 of this particular type and size, they were also equipped with mechanical stokers

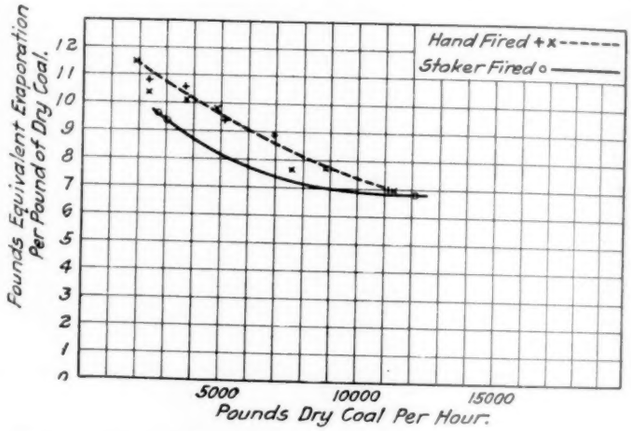


Fig. 1—Comparative Evaporation, Hand and Stoker Firing

which made it possible to use them in such service as I have just described.

The Pennsylvania has a Decapod type locomotive which weighs over 300,000 lb. on drivers; carries 250 lb. steam pressure and has a calculated tractive effort of nearly 90,000 lb. It is of special interest to know that this locomotive was originally designed to be hand-fired and the first one constructed was put in service without a stoker for the reason that it was intended to operate these locomotives only within the limits of coal consumption which could be fired by hand through sustained periods. Over 100 of these locomotives have been built to date and not only the first one which was originally put into service hand-fired, but all of the others have been equipped with mechanical stokers.

Comparative Fuel Economy of Hand and Stoker Firing

The reason which led up to this application was entirely one of capacity rather than what is ordinarily referred to as economy. The first locomotive originally hand-fired was equipped with a mechanical stoker, and extensive comparative tests made to determine the relative economy of stoker-firing and hand-firing. The chart shown in Fig. 1 indicates the result secured, and confirms the statement that a stoker is not needed to do a job which can be done by hand, nor can the stoker job be done by hand-firing.

It will be noted that within the limits of hand-firing, namely, below 5,000 lb. of coal consumption per hour, there was a slight difference in economy shown in favor of hand-firing. It will be further noted, however, that when the rate of fir-

ing in the different tests was increased to where the stoker became a necessity that no difference in economy in favor of hand-firing occurred, and, as a matter of fact, while the hand-firing was of the most expert nature, the capacity was not reached by hand that was easily obtained with the stoker.

A most interesting situation was developed in connection with putting these locomotives into service under actual operating conditions, which was fully to be expected from the re the hand-fired run was made, the traffic was exceptionally heavy and one manifest and one drag freight train were immediately behind the hand-fired train on the 13-mile grade which would not have been the case had that particular trip been stoker-fired and the 31 min. less time consumed on the hill.

Fuel Economy Sacrificed for Increased Capacity

There has been much discussion in connection with the application of mechanical stokers to locomotives as to the comparative economy between stoker-firing and hand-firing, and I wish to refer again to my earlier statement that stoker-sults shown in this graphic chart. One of these locomotives was put in service with its rated tonnage on a certain division and hand-fired, the coal consumption noted, and other records made of the performance. Very shortly thereafer another test was made with the same locomotive over the same division with similar tonnage, all conditions being duplicated as far as possible except that the locomotive was stoker-fired instead of hand-fired. The coal consumption, the water evaporated and the horse-power hours developed over the division were almost identical in each instance.

The significant fact in connection with the comparative tests, however, is that it required 11 hrs. to develop the necessary horsepower-hours to take the train over the division hand-fired, whereas, practically the same horsepower-hours were developed and the train taken over the division in 7 hrs. when stoker-fired. In other words, taking a maximum hand-firing capacity of approximately 5,000 lb. per hr. as a gage of the limit of hand-firing, this would mean that by firing 8,000 lb. per hr. into the fire-box of the same locomotive with the stoker the same number of horsepower-hours could be developed in 7 hrs. that it took 11 hrs. to do by hand.

From the traffic point of view I believe there would be no argument if there were no other considerations than this marked difference in time saved by developing more horsepower with the stoker on this very large locomotive than was possible to do by hand even with the same measure of economy. One of our engineers estimated the difference in results, however, from another point of view; namely, reducing the tonnage to a point where the train could be handled over the division by hand-firing in seven hours to compare with the heavier train stoker-fired over the same division in seven hours. A very conservative estimate would indicate that on the basis of seven mills per revenue ton income per mile the locomotive would pay for itself in less than 100 trips by being stoker-fired and hauling the heavier tonnage. There has not come to my attention in all of our stoker experience a better example of the real purpose of the stoker than its application to this large lot of locomotives.

Special Service Conditions Make Stokers Necessary

In marked contrast to these large locomotives is a small Consolidation locomotive in service on the El Paso & Southwestern to 21 of which stokers have been applied and which are the smallest locomotives to receive stokers to date so far as I know. They have a tractive effort of but 47,000 lb. The considerations, however, leading up to the stoker application had nothing to do with capacity or economy. The climatic conditions in the desert country during a large part of the year which made it almost impossible to secure firemen to operate such locomotives at all was the main factor so that it was not in any sense inconsistent to apply stokers even to these small locomotives in order to operate them, although I understand the hauling capacity has been actually increased by the stoker application, which it would be very natural to expect under the circumstances.

We come now to a consideration of some of the results which have been achieved by the stoker applications that have been made in different parts of the country and on different locomotives up to this time.

The data shown in Table I. were obtained by the Atchison, Topeka & Santa Fe in tests of a Mikado locomotive having approximately 60,000 lb. tractive effort. This tabulation will serve to bring out some points with regard to coal consumption per hour as related to the hauling capacity of a locomotive of this kind when it is desired to increase the

Table I—Comparative Test Data, Hand and Stoker Firing

Test No.	Tonnage	Cars	Loads	Empties	Running time Hr. Min.	Coal used, lbs.	Evaporation Per lb. coal	1,000-ton miles	Coal per 1,000 T. M.	Coal per hour	Coal per sq. ft. gr. per hour	Average steam pressure	Hand or stoker
7	2,579	65	63	2	6:42	35,000	5.62	281.9	124.2	5,224	78.2	184.3	H
9	2,713	69	60	9	5:48	35,500	5.58	296.6	119.8	6,121	91.3	178.8	S
11	2.849	71	67	4	6:34	46,600	4.75	311.4	149.7	7,096	106.2	175.7	S
13	2,835	74	58	16	5:40	38,083	5.39	306.8	124.3	6,721	100.6	177.0	S
15	2,848	75	73	2	5:38	41,076	4.91	300.1	136.8	7,403	110.8	185.9	S
17	2.896	56	56	0	5:53	43,300	4.73	312.8	138.4	7,360	110.7	185.8	S
19	2,872	71	66	5	6:31	44,890	4.55	310.2	144.7	6,888	103.1	167.5	S
21	2.869	65	65	0	5:28	35,600	4.76	313.6	113.5	6,512	97.7	183.6	S
23	3,059	73	72	1	6:04	37.350	5.03	334.3	111.7	6,156	92.0	179.4	S
25	3.061	65	56	9	6:10	38 250	5.57	334.6	114.3	6.203	92.9	181.2	S
27	2,887	61	57	4	5:27	32,300	5.62	314.6	102.7	5.927	88.7	187.7	S

revenue tons per train. The significant points about this tabulation are that the coal consumption per hour is fairly representative of the difference between the maximum possibilities of hand-firing and the ordinary range of operation when stoker-fired.

It will be noted that the coal consumption per hour on hand-fired run No. 7 was 5,224 lb. per hr. or 78.2 lb. of coal per square foot of grate area per hour. This brought a coal consumption per thousand ton miles of 124.2 lb. and I believe represents maximum hand-firing possibilities. All of the ten other trips shown on this tabulation show a coal consumption of from 6,000 lb. to 7,400 lb. per hour, and taking the high and low coal consumption per thousand ton miles, the average happens to be for the ten trips almost to a fraction the same as the coal consumption per thousand ton miles for the hand-fired trip, the larger percentage of the stoker-fired trips being below the hand-fired trips in coal per one thousand ton miles. A maximum increase of nearly 500 tons per train was secured on some of the stoker-fired trips, and it will also be noted that on no stoker-fired trip was the actual running time as long as on the hand-fired trip.

Speed on Grades Increased by Stokers

At the end of one of the runs I took occasion to go into the train despatcher's office, look over his operating sheet, and make inquiries as to the time required by all of the freight

Table II—Time on Ruling Grades

Engine No.	Gross tons	13-Mile grade 31.68 feet. Per mile	8-Mile grade 31.68 feet. Per mile
3211	1,800	61 min.	30 min.
3202	2,180	48 min.	27 min.
3207	1,950	63 min.	25 min.
3209	2,900	50½ min.	31 min.
3206	2,120	75 min.	32 min.
3200	1,945	46 min.	31 min.
3121	2,000	58 min.	.....
3192	2,285	82 min.	.....
3193	1,850	54 min.	.....

trains westbound on that day to cover a 13-mile and an 8-mile 6/10 per cent grade, which grades are the limiting factor on that particular division. The result of that inquiry is shown in Table II.

The 2,900 tons taken up the 13-mile grade in 50½ min. has illustrated better than any description that could otherwise be given the real purpose of the application of a stoker to a locomotive like the Mikado which hauled this train as compared with other similar locomotives hauling from 500 to 1,000 less tons in longer time up the same grade hand-fired. It is true that more coal was consumed in the 50½ min. hauling 2,900 tons in that time up the 13-mile grade than would have been the case if the locomotive had been operated at a less cut-off, less throttle and consequently less speed, but the fact remains that to get maximum tonnage over the

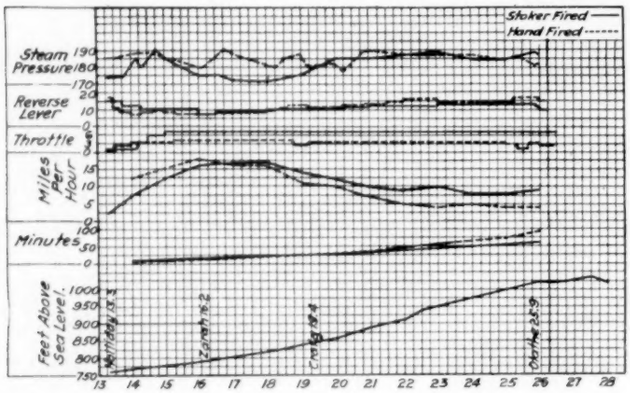


Fig. 2—Hand and Stoker-Fired Tests on 13-Mile Grade

division in the minimum amount of time requires this kind of locomotive performance. In addition to illustrating the main purpose of the stoker it also shows why it is quite often stated that from the point of view of water evaporated per pound of coal the coal consumed per locomotive mile is more when stoker-fired than might be the case when such a locomotive was hand-fired under less strenuous conditions.

In order to get a more direct comparison of the possibility of hand-firing and stoker-firing with the tonnage rating such as shown on the stoker-fired trips of the tabulation, and also

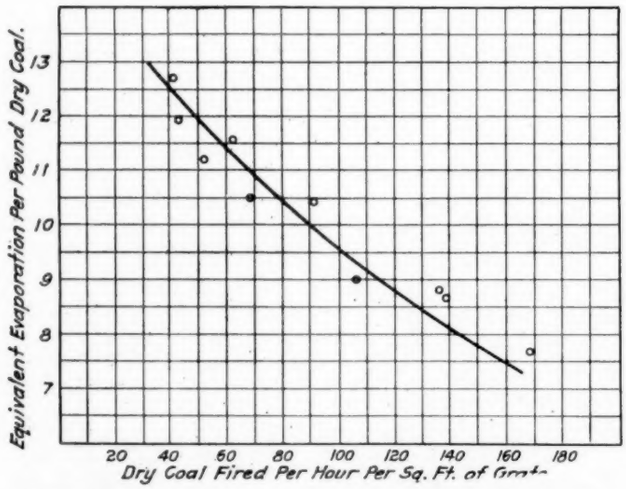


Fig. 3—Effect of Rate of Firing on Equivalent Evaporation

to compare the performance on the 13-mile grade with the 2,900-ton train, a hand-fired trip was made over the division with what might be called stoker tonnage. Fig. 2 is a graphic chart showing the comparative performance between a hand-fired and a stoker-fired trip. It will be noted that the locomotive was worked at a point stoker-fired which was not possible on the hand-fired trip, the result being that 31 min. more time was required to take the train with stoker tonnage up the 13-mile grade with hand-firing than with stoker-firing. I know of no better illustration of the real purpose of the stoker than that shown on this chart.

There are additional points of interest which cannot be plotted by curves namely, that on the particular day on which firing and hand-firing are not directly comparable. The reason for this has really nothing to do with the stokers themselves, but is due to the different points at which the locomotive is worked with hand-firing as compared with stoker-firing.

The diagram shown in Fig. 3 illustrates the rate of evaporation as related to the rate at which dry coal is fired per square foot of grate area per hour. The tests indicated on this diagram were all hand-fired so that this drop in the evaporation rate had nothing whatever to do with hand-firing as com-

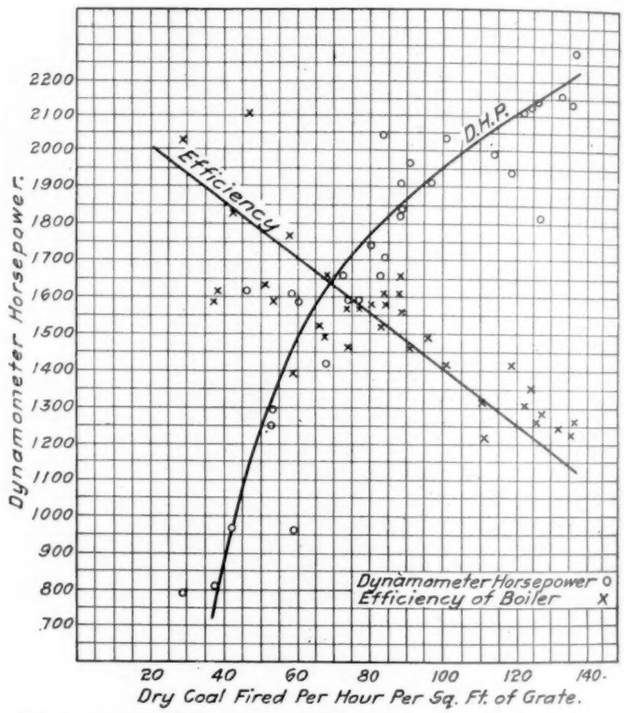


Fig. 4—Boiler Efficiency as Related to Horsepower Chart

pared with stoker-firing, but must be definitely borne in mind as usually being related to the price we must pay when we stoker-fire a locomotive to its maximum capacity; in other words, get a coal consumption rate up to the point shown on some of the tabulations.

The next diagram, Fig. 4, illustrates the point even better. The many tests plotted on this diagram were practically all hand-fired, but no better illustration could be prepared to illustrate the price we must pay for operating the modern locomotive to its maximum capacity.

There are many locomotives being operated at the point where less horsepower output is being secured in order to keep the evaporation of water per pound of coal up to a point shown in the left-hand section of this diagram, but on the other hand there are very many more locomotives being operated under the conditions shown on the right-hand section of this diagram and, of course, from the stoker manufacturers' point of view, this is really where we expect a large locomotive to be operated if equipped with a stoker.

The reason that more locomotives are operated at their highest possible horsepower output, notwithstanding the fact that this brings a decrease in so-called boiler efficiency, is, of course, because a very satisfactory return is secured on the price paid for such operation. This price is represented in

the cost of coal per locomotive mile, and the returns on the investment are represented in the reduced cost of coal per ton mile brought about by the increase in revenue tons per train hauled by the locomotive when operated at its maximum horsepower output. The curves in Fig. 5 illustrate the relation

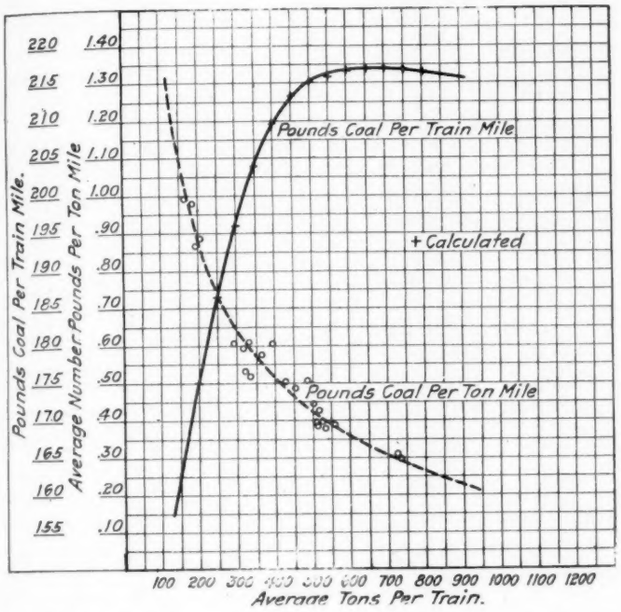


Fig. 5—Relation Between Coal per Train-Mile and Tons per Train

between the increased cost of coal per locomotive mile and the decreased cost of coal per ton in the heavier train so hauled.

This decrease in cost per ton mile is not altogether confined to coal alone as the increased revenue tons per train made possible by the maximum horsepower output of the locomotive is directly related to crew wages as well. Fig. 6 illustrates the decrease in the cost per ton mile of both coal and crew wages combined, and further illustrates why it is desirable to operate modern freight locomotives up to their maximum capacity even at an increased cost of coal per locomotive mile.

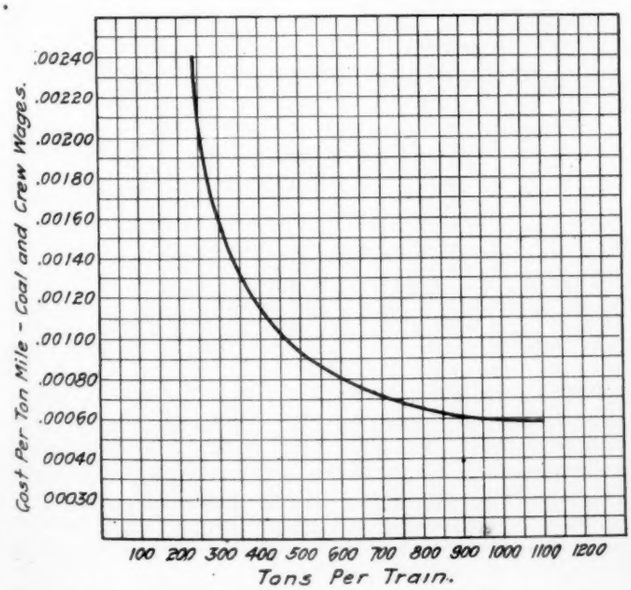


Fig. 6—Cost of Coal and Crew Wages as Related to Tons per Train

I have said nothing so far in this paper about the stoker doing the manual work of the fireman or relieving him from the suffering incident to the heat of the fire-box due to opening the fire door when hand-firing, as it has been my endeavor to illustrate the returns which are being secured on the large investment which has been made in mechanical stokers for locomotives during the past six or eight years. It goes without saying, however, that there are many other advantages in the application of stokers to locomotives. One of these is, of course, the relief of the firemen, making the position of locomotive fireman more attractive and, therefore, making it possible not only more readily to secure men for this work, but also to select those men who are particularly qualified later to become locomotive engineers rather than to consider only their physical stamina for the more arduous work of hand-firing.

I have tried to be very frank in my statements and have in no sense endeavored to have you reach a conclusion that it is not necessary to pay a certain price for the use of the stokers on locomotives such as have been equipped with them. On the other hand, it is very plain that whatever the price that it is necessary to pay it brings a most satisfactory return from every point of view. Objections can be raised against the stokers, of course, just as objections can be raised to many of the other modern labor-saving and capacity-increasing devices and features which have been added to locomotives in recent years to enable us to travel the avenues of economy which have brought such large returns in present-day railroad operation. The mark which we are aiming at in the application of mechanical stokers to locomotives is mainly one of capacity; and in the sense that the word economy is ordinarily used, we must conclude that the kind of locomotive capacity which I have pointed out, namely, maximum horsepower output, must take precedence over economy for large modern locomotives.

It is significant that the cost of coal is after all a comparatively small part of the total operating expenses, and as the economies that occur from any increase in revenue tons per train mile have a much larger influence upon the net annual earnings of any given railroad company than does any variation either up or down of the cost of total coal used per annum by that railroad. It follows that what must be accomplished first and above all other things is to increase the revenue tons per train mile.

Photo from Underwood & Underwood, N. Y.

American Soldier Students at the University of Birmingham, England, Waiting for Their Train

Doings of the United States Railroad Administration

WASHINGTON, D. C.

To satisfy the curiosity of Senator Newberry, who recently had a resolution passed by the Senate calling on the Railroad Administration for complete information regarding the issuance of passes good on all lines under federal control, which the Senator thought also covered free dining car and sleeping car service, Director General Hines has reported to the Senate that all-line railroad passes have been issued by the Railroad Administration to 4,114 persons during the period of federal control, of which 119 have been cancelled in the regular order of business, leaving 3,995 outstanding on July 1, 1919. Also all-line Pullman passes have been issued to 2,418 persons, of which 515 have been cancelled, leaving 1,903 outstanding on July 1. In view of the detailed nature of the information requested, Mr. Hines says the facts cannot be presented immediately but pending a complete report he submitted general facts to the Senate. His letter says:

No passes are issued for free dining-car service.

In issuing passes good on railroads under federal operation and good for sleeping-car and parlor-car accommodations, the Railroad Administration has been guided by the established practices which have been adopted under private control in conformity with the provisions adopted by Congress in the Interstate Commerce Act and in amendments thereto, governing the matter of free passes.

Under private control, it was the general practice for the principal railroad officers to have annual passes on their own railroads and in addition to obtain exchange passes from practically all other railroads in the country, so far as they might be applied for. The result was that each of these general railroad officers had a large number of annual passes covering most of the important mileage in the country. In addition, the chief managing officers very frequently had annual Pullman passes good on all Pullman lines in the United States. The officers who had annual passes for themselves on the railroads generally also had annual railroad and Pullman passes for the dependent members of their families, or could and did obtain trip passes as a matter of course upon request.

The general policy of the Railroad Administration was to take these established practices as its standard and on that basis to give passes good on all lines only on account of representatives of the Central Administration and on account of such railroad officers as had customarily had available to them annual passes good on practically all mileage under federal control.

Annual passes good over all lines have been issued broadly to the following classes of persons:

Officials of the Central Administration which, of course, has jurisdiction over all lines.

The seven regional directors and the principal members of their staffs.

The federal managers of the various railroads and other officials who under private control had at their disposal passes on any line desired, such officers under private control having generally speaking, held exchange passes over practically all railroads in the United States, or over all such railroads as might be included in their request for passes.

The chief executives of the railroad corporations, (including the chief officers of the Association of Railroad Executives and the Secretary of the American Railroad Association), such chief executives having had under private control passes over all railroads, or over such railroads as they might include in the requests therefor.

Dependent members of the families of the foregoing persons.

The chief officers of the American Short Line Association, Western Railroad Association, Railway Accounting Officers' Association, Association of Transportation and Car Accounting Officers, and Association of Western Railroads.

Nearly 98 per cent of the all-line passes issued by the Railroad Administration, are restricted so as not to be good on certain specified limited trains.

Pullman passes, good on all lines, have been issued, broadly, to many member of the same classes mentioned above.

Passenger Traffic in April

The number of passengers carried one mile during the month of April was 3,472,502,638, according to the monthly report of the Operating Statistics Section. This is an increase of 3 per cent as compared with April, 1918. The Ohio-Indiana district and the Southern region show decreases. For the four months ended April 30 the increase in passenger traffic was 5.9 per cent, all regions showing an increase except the Ohio-Indiana district of the Eastern region. The figures follow:

Railroad	Average miles operated	Month of April				Four Months Ended April 30			
		1919	1918	Increase or decrease	Per cent	1919	1918	Increase or decrease	Per cent
Total, New England District	8,116	300,648,425	283,140,522	17,507,903	6.2	1,124,259,418	1,044,850,176	79,409,242	7.6
Total, Central District	22,396	504,917,014	451,520,758	53,396,256	11.8	1,900,954,218	1,695,859,150	205,095,068	12.1
Total, Ohio-Indiana District	6,941	68,996,520	75,993,474	d 6,996,954	d 9.2	271,356,206	275,177,878	d 3,821,672	d 1.4
Total, Eastern Region	37,453	874,561,959	810,654,754	63,907,205	7.9	3,296,569,842	3,015,887,204	280,682,638	9.3
Total, Allegheny Region	19,814	735,876,794	708,894,259	26,982,525	3.9	2,786,274,669	2,546,410,591	239,864,072	9.4
Total, Pocahontas Region	5,094	70,989,203	65,055,711	5,933,492	9.1	300,996,101	247,858,043	53,138,058	21.4
Total, Southern Region	38,192	483,425,122	518,065,083	d 34,639,951	d 6.7	1,988,599,805	1,979,917,731	8,582,074	0.4
Total, Northwestern Region	46,719	383,761,516	362,499,239	21,262,277	5.9	1,516,482,812	1,415,795,728	100,687,084	7.1
Total, Central Western Region	51,919	636,180,783	618,351,885	17,828,898	2.9	2,470,040,938	2,403,750,651	66,290,287	2.8
Total, Southwestern Region	31,664	287,707,261	287,494,517	212,744	0.1	1,161,912,812	1,152,769,963	9,142,849	0.8
Grand total, all regions	230,855	3,472,502,638	3,371,015,458	101,487,180	3.0	13,520,876,973	12,762,389,911	758,487,062	5.9

Contracts Executed

The Railroad Administration has executed co-operative short line contracts with the Wabash, Chester & Western and the Willamette Valley & Coast.

Delays Are Dangerous.—More than six months have elapsed since the president passed the railroad question over to Congress for solution. How near is Congress to a solution? Plans for restoring the roads to their owners are so numerous that few persons can remember the salient differences between them. Congress is unlikely to be in a mood to deal with railroad legislation until the peace treaty is disposed of, and autumn may have come before the railroads will be tackled in earnest. The prospect of very high operating expenses seems to have slackened the demand from railroad owners that government operation be terminated immediately. One member of the Interstate Commerce Commission holds that rates should be kept where they are and the railroad deficit loaded onto the federal treasury. If the deficit is to be wiped out, freight rates must go up very soon.—*Springfield Republican.*

Equipment Standardization in Belgium and France

Vast Amount of Equipment Destroyed During War—Changes of Design to Be Made in Replacements

By Robert E. Thayer,
European Editor of the *Railway Age*

PARIS, June 21, 1919.

ON ACCOUNT OF THE GREAT AMOUNT of damage done to the cars and locomotives in the northern part of France and throughout Belgium by the Germans during the war, and also because of the fact that the maintenance of equipment in both of these countries had to be seriously neglected, there is a very large amount of rehabilitation work to be done. Large quantities of new equipment must be built eventually, and vast quantities of equipment must be repaired. The situation thus lends itself admirably to a certain amount of standardization which is being considered in both of these countries.

The work in Belgium has not developed to the extent that it has in France, but the conditions in Belgium are such that until the disposition of the German equipment running on Belgian rails under the terms of the Armistice is known, no definite plans will be formulated. The Belgians, in addition to their varied stock of power, have had to cope with the added inconvenience of some 40 to 45 designs of German locomotives and innumerable designs of German cars. This has accentuated the need of equipment of more unoform design. It is the desire of the State railways there eventually to return the German equipment and receive indemnities with which to buy new equipment. If this is granted—it is doubtful if it will be—some plan of standardization will be formulated as a vast amount of equipment will have to be built to replace the equipment destroyed during the war.

Standardization Plans in France

In France, standardization has been thought of for some time. Last year, M. Claveille, Minister of Public Works and Transports, asked the locomotive builders of France to consider the situation, and seven preliminary designs of locomotives were evolved, but nothing has been done with them. At the present time, however, four of the important French railways, namely, the Paris-Lyons-Mediterranean, the Paris-Orleans, the Midi, and the State railways, have formed a committee for the consideration of standard equipment. Two designs of locomotives are being considered, one of the Pacific type for passenger service, which will have driving wheels of about 78-in. in diameter, and a Mikado locomotive for fast freight and heavy grade passenger service, having driving wheels of about 65-in. in diameter. It is very interesting to note that these locomotives will be of the two cylinder, simple, superheater type. With the improvements in the design of this type of locomotive, it is now generally conceded in France that the economies obtained from the compound locomotives as compared with a good design of two cylinder, simple locomotive using superheated steam, do not warrant the increased first cost, the increase in the cost of maintenance and the added complication of the compound locomotives. Furthermore these standard engines will have a lower factor of adhesion than is customarily used in America. The design will probably not give a factor any higher than 3.5.

The traffic conditions in France are such that a high speed locomotive is needed both in passenger and freight service. The Pacifics will be designed to operate at a speed of about 74 m.p.h. and to work on grades of 0.5 and 0.6 per cent. The Mikado locomotives are to be built for speeds of about 56 m.p.h. and for grades of from one to 1.2 per cent. The axle load of these locomotives will be limited to about 41,000-lb. as that is the limit required by the Minister of Public Works and Transports of France. This limit is set on account of the fact that many of the bridges in France are too weak to carry a higher wheel load, and as a general rule there are two less ties used per rail than in America.

The adoption of these two standard types of locomotives does not mean that other locomotives will not be built. The committee has taken a very sane view of the matter, and is preparing designs to meet conditions common to all of the four roads in question. It is expected that other locomotives will be designed and built by any of the four roads to meet any special conditions they may have. However, as many details as possible will be the same as those used on the standard designs.

There are five standard designs of cars to be built; two types of box cars, with and without screw brakes; two types of coal cars, with and without screw brakes, and flat cars with no screw brakes. The question of power brakes is under consideration. It is the desire of progressive engineers in France to have continuously braked freight trains, but whether this will be permitted with the excessive amount of slack between the cars of the present day French freight train with its present type of coupling, remains to be seen.

Several engineers have expressed a strong desire to use automatic couplers, but with the present screw type of coupler generally used in France, the introduction of the automatic coupler would entail numerous difficulties, and until some design of automatic coupler is made which will readily interchange with the screw type of coupling now used, but little will be done in this respect.

The work on standard passenger cars has not progressed to the same extent as in the freight cars. They will, however, be of all-steel construction. This type of construction is not new to French railways. The Paris-Orleans has built nothing but steel passenger equipment for years, and, in fact, some of our first steel equipment was patterned after the Paris-Orleans designs.

Need of New Equipment in France

The equipment situation in France at the present time is such that they need new locomotives and passenger cars. The locomotive situation was helped out to a certain extent by 2,700 locomotives received from Germany under the terms of the Armistice, and by the U. S. A. Pershing locomotives. There is a need for more locomotives, however, and 1,118 locomotives, which are to be built to existing designs, have been ordered by M. Claveille, Minister of Public Works and Transports, for all French railways. These are supposed to be delivered by the end of 1920, but whether they will or not is a very serious question.

With the German freight cars and the American freight cars, if all of the former are to remain in France, the freight car situation is not bad.

It is interesting to note here that both the orders for locomotives and passenger equipment were placed with French concerns regardless of the fact that better prices and better deliveries could be obtained elsewhere. This has been the policy of the government in practically all of its rehabilitation work and it has been done to give business to the French concerns and employment to French labor.

Railway Developments in Foreign Countries

Swiss Railways Extend Electrification—Railroad Concessions in Mexico to Be Limited in Future

Proposed New Railroad Between Ibague and Ambalema, Colombia

Counsel C. E. Guyant, Barranquilla, reports that the important firm of Pedro A. Lopez & Co., of Bogota, has just signed a contract with the Department of Tolima for the construction of a railroad between Ibague, the capital of the Department, and Ambalema, on the Magdalena River, to connect at its river terminus with the La Dorado Railway and at the other end with the new Girardot-Ibague line, which is a link in the projected Pacific Railway. The importance of the newly contracted line is that it will do away with the necessity for using the upper Magdalena River as a link in the route to Bogota, and will provide an all-rail route from La Dorado (head of navigation on the lower Magdalena) to the capital. It will also give the Department of Tolima direct connection with the main river traffic.

By the terms of the contract (dated May 22, 1919), work must be begun within three months and be completed within four years. Construction materials and rolling stock will most probably be purchased in the United States.

German Destruction of French Locomotive Works

Belgian correspondents call attention, says the Railway Gazette, London, to the damage done by Germans to the famous locomotive works of the Compagnie Fives-Lille. Equipment to the value of $10,000,000 has been removed or destroyed. One item in this list of destroyed apparatus includes 750 electric motors. The Germans employed highly efficient methods of demolition. For example, they introduced the use of massive blocks of iron as battering rams to demolish the machinery that they had not the opportunity to remove. These blocks they swung by chains from overhead travelling carriages, then drove them against the machinery marked for destruction. An alternative method was to hoist the machines themselves as high as possible, then let them crash down on the cement floor. The invaders sometimes coveted the steel construction sheds in which the equipment was housed. Three of these sheds, for instance, were more than 600 ft. long and 120 ft. wide, and yet the wreckers dismembered these sheds, packed them with care, and sent them on their way toward the Rhine. These facts and figures may serve to give some conception of the vast amount of new equipment that will be needed before the factories in the Lille district can be put on a productive basis again.

Government Construction Instead of Concessions in Mexico

Applications filed by American and other foreign investment interests for concessions for the construction of electric and steam railroads and various other kind of industrial enterprises are now pending with the Department of Communications and Public Works of the Mexican government. It is indicated by the attitude of the Carranza administration toward outside capital that these applications may all be rejected. The government has already adopted the policy of not granting any new concessions for the construction of additional lines of steam railroads. It has announced its intention of doing on its own account whatever railroad building may be deemed necessary, adding such lines to the National Railways of Mexico. Recently application was filed with the Department of Communications and Public Works for a concession to construct an electric interurban railway through the oil fields of the Gulf coast region, connecting Tampico and Tuxpam. The proposed line would be about 120 miles long. No action has as yet been taken upon this application. American oil interests are back of the project.

It is announced by the Department of Communications and Public Works of the Mexican government that it has just granted a concession and awarded the contract for the construction of a railroad between Toluca and Zitacuaro, state of Michoacan, about 82 miles. Employment will be given to several hundred native laborers in the building of the road. It will traverse a region that is rich in agricultural resources. At Toluca the line will connect with the National Railways of Mexico.

As a means of affording a transportation outlet for a large tract of virgin timber land and to bring about the agricultural development of the intervening country the Mexican government is constructing a railroad from Saltillo into the mountains, traversing a rich valley region for part of the distance. The new line will be about forty miles long. The timber tract which it will penetrate is owned by E. E. Shaw of the City of Mexico and associates. They plan to build a large lumber mill and to operate the industry on a large scale when the railroad is finished. James F. Martin & Company of Saltillo have the contract from the government to construct the railroad.

The Swiss Railways Extend Electrification

The introduction of electric traction on the lines of the Swiss Federal Railways has, on account of the acute shortage of coal occasioned by the war, received the foremost attention of the authorities and has now emerged as a very practical economic question.

The principal arteries of the Swiss railway system are government owned. The elctrification of thse lines is simplified by the large amount of unused water power which the country possesses. According to an official survey, verified in 1914, including the improvement and water level control of lakes, the water power of Switzerland is capable of producing an energy equal to 2,173,000 h. p. If old plants were replaced by new ones it is even estimated that the total water power could be raised to as much as 8,000,000 h.p. On January 1, 1914, the electric power already in use in Switzerland amounted to 887,000 h.p.

The Swiss Confederation owns some 1800 miles of the entire railway system of the country which covers 3216 miles. Of the 1416 miles owned by private companies 622 miles are already electrical, but only an insignificant percentage of the government railroads is at present operated by electricity.

The first important federal standard-gage road to be chosen for electrification was the Gothard Railway, one of the important international highways. The electrification of the 68-mile section Erstfeld-Bellinzona was approved in 1913 and it is expected that it will be opened this fall. This section, with 28 per cent of its length consisting of tunnels and a grade of 2.5 to 2.7 per cent for 25 miles, was chosen for an experiment because of its enormous traffic with Italy, which caused large consumption of coal with resulting smoke in the tunnels.

The sections Bellinzona-Chiasso and Erstfeld-Lucerne are expected to follow in 1921 and the consulting experts have

found that the big power stations at Amsteg and Ritom, the first yielding 26,000 h.p. and the latter 32,000 h.p., will also suffice for these lines, even if the traffic should increase some 60 or 70 per cent. Another series of plants yielding 70,000 h.p. is planned for eastern and central Switzerland.

The cost of electrification of the Erstfeld-Bellinzona line is estimated at $8,000,000. The cost of electrifying the entire federal railway system is estimated roughly at $200,000,000.

In 1918 the electrification of the following railways using steam traction was decided upon and work on them commenced at once: the sections of the Federal Railroad Sion-Brigue and Berne-Thun; the section Hasle-Langnau of the Emmenthal Railroad and the section Bevers-Filisur of the Rhaetian Railroads.

The Sion-Brigue section which is to be electrified will be a continuation of the electrically operated Simplon tunnel which was opened for traffic in 1906, with its northern exit at Brigue.

The electrified Berne-Thun line, connecting with the electric Berne-Lötschberg-Simplon railway, which latter was inaugurated in 1913, was opened for traffic last May. It now provides excellent and frequent train connections between the Swiss capital, the Bernese Oberland resorts and—in connection with the Lötschberg line—the Valais and Northern Italy.

The new locomotives which are now being used by the Swiss Federal Railroads on the Berne-Thun section, besides those of the Berne-Lötschberg-Simplon line, are each equipped with four single phase-alternate current motors, each of 450 h.p. The electric parts were furnished by Brown-Boveri & Co., Baden, and the mechanical parts by the Swiss Locomotive & Machine Company of Winterthur, Switzerland.

The electrification works on the Bevers-Filisur line were completed by middle of last April and since April 16 steam locomotives have been replaced by electric locomotives, the current being supplied by the power station of Bevers, which furnishes the necessary energy for the Engadine lines which were electrified in 1913.

Exports of Railway Track Material in May

The exports of rails in May, amounting to 76,134 tons of a value of $4,902,970 were considerably greater than those of April but not as large as in February. The exports of railway spikes, amounting to $437,392 and those of frogs, switches, etc., were however, considerably in excess of those of any previous month so far this year. Of the rails, large shipments were made to Japan, France, China, Belgium and British South Africa. Over half the spikes and switches, frogs, etc., were consigned to France.

The figures in detail as compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce are as follows:

Countries	Railway spikes		Rails of steel		Switches, frogs, splice bars, etc.
	Pounds	Dollars	Tons	Dollars	Dollars
Belgium	354,270	16,931	7,932	463,571	24,219
France	3,519,804	290,972	14,874	890,227	1,094,016
Italy	.....	.....	713	64,170	.....
Norway	.....	.....	25	1,900	313
Spain	.....	.....	495	44,550	.....
Sweden	.....	.....	.....	.....	2,730
England	.....	.....	1,174	64,105	1,886
Scotland	.....	.....	176	12,637	919
British Honduras	.....	.....	.....	.....	58
Canada	15,648	543	3,056	104,466	21,656
Costa Rica	25,600	1,266	.....	.....	405
Guatemala	10,000	500	.....	.....	4,857
Honduras	7,000	308	.....	.....	1,922
Nicaragua	27,000	1,491	6	445	3,270
Panama	.....	.....	.....	.....	495
Salvador	45,000	1,755	.....	.....	.....
Mexico	32,500	1,895	1,249	50,004	21,746
Newfoundland and Labrador	56,000	2,251	.....	.....	.....
Jamaica	46,000	2,357	363	20,878	3,746
Trinidad and Tobago	.....	.....	.....	.....	78
Cuba	264,100	9,542	633	38,958	45,519
French West Indies	.....	.....	.....	.....	21
Dominican Republic	5,000	308	.....	.....	264
Argentina	.....	.....	.....	.....	6,386
Bolivia	.....	.....	37	2,320	74
Brazil	310,120	17,426	756	52,780	3,269
Chile	176,100	6,865	199	13,495	20,963
Colombia	60,800	2,880	915	56,407	868
Ecuador	2,000	101	115	6,469	.....
Peru	.....	.....	480	37,795	35,038
China	398,700	14,750	11,179	744,852	34,443
Japanese China	.....	.....	744	57,435	4,682
British India	.....	.....	576	32,056	4,701
Straits Settlements	1,760	157	.....	.....	.....
Dutch East Indies	272,016	12,744	3,981	243,196	17,086
Hongkong	.....	.....	13	926	.....
Japan	806,575	39,251	14,224	1,095,667	107,595
Russia in Asia	92,634	4,387	1,906	109,676	1,186
Siam	98,400	8,150	.....	.....	.....
Australia	.....	.....	.....	.....	120
New Zealand	.....	.....	99	5,932	458
French Oceania	.....	.....	38	3,738	607
Philippine Islands	15,600	549	581	37,375	5,864
Belgian Kongo	.....	.....	448	28,050	11,841
British South Africa	.....	.....	8,177	550,981	390,721
French Africa	200	13	100	6,000	6,000
Portuguese Africa	.....	.....	870	61,918	1,604
Total	6,642,827	437,392	76,134	4,902,970	1,881,626

Railroads as a Buying Element

IN SUPPORT OF THE DOCTRINE that "Railway Purchases Measure General Business Prosperity," E. B. Leigh, president of the Chicago Railway Equipment Company, Chicago, has compiled a series of graphic illustrations showing the value represented by the railways of the United States as compared with that of all manufacturing industries generally. The graphics themselves were prepared as a supplement to a recent address by Mr. Leigh on the general subject of railway purchases and business prosperity before the National Industrial Conference Board. However, they are practically complete in themselves and serve to bring into clearer relief the importance of the railways as the largest single buying element in the country.

In the largest circle (Fig. 1), Mr. Leigh compares the

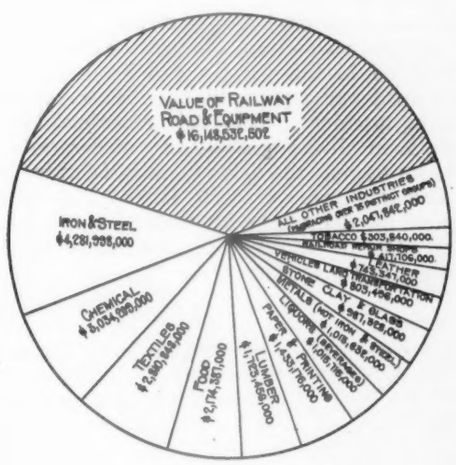


Fig. 1

Value of Railway Road and Equipment Compared with Total Invested Capital

value of railway road and equipment, estimated at $16,148,532,502, with the capital of all other manufacturing industries which total approximately $22,790,980,000. The latter division of the circle is in turn subdivided into the 13 leading industries with their respective total capital and the total capital of another division composed of over 75 other industries grouped together.

In Fig. 2 of the accompanying reproduction, the value of railway cars and locomotives, $4,137,318,000, is compared with the total value of the manufacturing machinery,

tools and implements of all other industries, which is $6,091,451,274.

Again in Fig. 3 the value of railway cars and locomotives only, $4,137,318,000, is compared with the total value of all farm machinery, implements and tools, $1,368,224,548. This comparison is perhaps the most striking of the series of graphics prepared by Mr. Leigh in that the shaded area of the circle representing the value of railway cars and locomotives fills practically three-fourths of the total area of the circle.

This graphic method of illustrating the comparative value of railway road and equipment to that of other industries has been further enhanced by the preparation by Mr. Leigh of a series of charts showing similar comparisons by geographical divisions of the United States. These show that in

VALUE OF RAILWAY CARS & LOCOMOTIVES $4,137,318,000
VALUE OF MANUFACTURING MACHINERY TOOLS & IMPLEMENTS (ALL INDUSTRIES) $6,091,451,274.
Fig. 2
VALUE OF RAILWAY CARS & LOCOMOTIVES $4,137,318,000
VALUE OF ALL FARM IMPLS. & MACHINERY $1,368,224,548.
Fig. 3

Value of Cars and Locomotives Compared with Manufacturing and Farm Machinery

the New England division railway road and equipment, valued at $501,391,191, almost equals the value of manufacturing machinery, tools and implements of all industries, valued at $766,480,256, exclusive of farm implements and machinery, which are valued at $53,648,227. Railway road and equipment in the South Atlantic states is shown to be valued at $1,976,695,855 as compared with manufacturing machinery, tools and implements, valued at $545,733,504 and farm implements and machinery at $107,212,399. In the New England, Middle Atlantic and North Central States the railway road and equipment exceeds in value that of manufacturing machinery, tools and implements by $1,000,000,000, while in all the other states together railway road and equipment exceeds the value of manufacturing machinery, tools and implements by over $10,000,000,000.

The figures for the graphs have all been taken from the United States Census reports of 1912-1914, the latest official compilations which give comparable data.

I. C. C. Serves Tentative Valuations

THE INTERSTATE COMMERCE COMMISSION on July 23 announced its tentative valuation of the property of five small railroads, the Wrightsville & Tennille, the Missouri Southern, the Alabama Central, the Tooele Valley and the St. John & Ophir. Any protests which interested parties desire to make must be filed with the commission within 30 days.

The Wrightsville & Tennille, located in Georgia, owns 120.26 miles of track. Its book investment in road and equipment is stated as $1,039,902, after some adjustment. The original cost, other than land, the report says, cannot be ascertained. The cost of reproduction new and cost of reproduction less depreciation of all common carrier property other than land, owned and used by the carrier, are reported as $1,563,556 and $1,180,617, respectively. The original cost of land is given as $17,999 and its present value as $243,383. The valuation is as of June 30, 1915.

The Missouri Southern owns 70.3 miles of tracks, in Missouri. Its investment in road and equipment as stated in the books is $802,483, but the account is reported to be not reliable. The original cost is not reported. The cost of reproduction new, exclusive of land, is given as $920,912, and less depreciation as $770,945. The cost of lands is given as $24,345 so far as ascertainable, and the present value as $25,168. The report is as of June 30, 1914.

The Alabama Central, with a mileage of 8.79, is given a cost of reproduction new of $85,428 and, less depreciation, of $68,482. The book investment in road and equipment is $96,000. The carrier lands are given a present value of $1,099. The report is as of June 30, 1915.

The Tooele Valley has 7.9 miles, in Utah. Its book investment is given as $346,224. The report finds that this represents the original cost as found on the records. The cost of reproduction new of property wholly owned is given as $255,216, and, less depreciation, as $206,207. The cost of lands owned by the carrier and used solely for common carrier purposes was $5,071. The cost of some additional land is given as $1,000. The present value of land is given as $8,976. The report is as of June 30, 1915.

The St. John & Ophir, with 8.4 miles, in Utah, has a book cost of $139,161. This the report finds to be the original cost to date as nearly as it can be given. The cost of reproduction new is given as $127,414, and less depreciation as $110,103, and the lands are given an original cost of $858 and a present value of $663. The report is as of June 30, 1915.

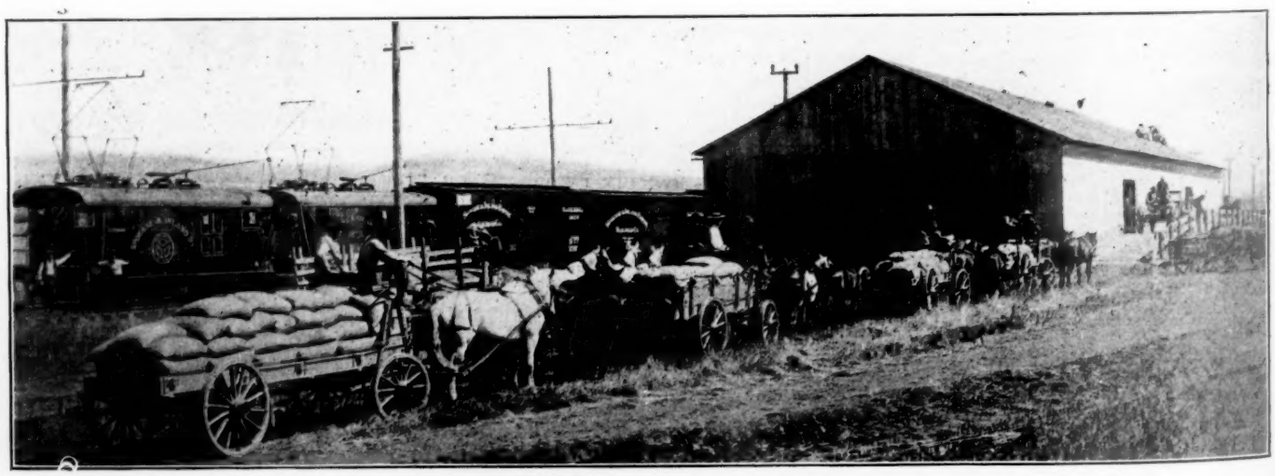


Photo from Underwood & Underwood **Hauling Freight on Electric Railways**

Farmers delivering wheat at a station on the Spokane & Inland Empire in eastern Washington.

Some Comments on the Railroad Problem

Strong and Weak Roads—Consolidation, Pooling, Net Earnings and Government Guarantee Undesirable

By Robert S. Lovett
President, Union Pacific System

I

IN THE DISCUSSION of the railroad problem now before Congress, it seems safe to assume that the following propositions are too clear to require or admit of argument:

1. That it is necessary for Congress to enact, at the earliest date practicable, legislation required to develop and continue to provide the railroad facilities which the country must have.
2. That the country has definitely made up its judgment against the ownership and operation of the railroads by the government.
3. That public opinion overwhelmingly favors the continuance, by private ownership, of competition in service and facilities furnished by railroad carriers.

It will be assumed, therefore, that these propositions are established, and they will not be discussed.

The Strong and the Weak Companies

Most of the discussion recently has centered about, and given great prominence to, the supposed difficulty presented by the case of the strong and the weak companies operating railroads in competition.

Now, many of the weak roads are weak because they serve territories which, for various reasons, afford but little traffic—sparsely settled, poor in agricultural or other production, etc.—but which nevertheless are giving the service which the traffic justifies.

I presume no one expects service substantially out of proportion to the traffic.

Some of the weak roads are weak because they are in competitive territory. Their traffic is competitive, and they are not able to get sufficient traffic away from rivals to become prosperous. These roads are not so vital to the community because the competing roads afford the transportation required.

Other roads are weak as a result of mistakes in policy, unsound financing, or bad management; and many because building, in the first instance, never was justified by the traffic obtainable.

All weak roads, however, are put in the same category in the discussion seeking relief for them, regardless of the cause of their condition or the public necessity for more service than they are now performing.

Furthermore, in the discussion little attention has been paid to the fact that the business of the country is not handled by the so-called weak roads. That is generally the reason why they remain weak.

But under the government policy of inflexible or declining transportation rates for a number of years, during which wages and other operating costs have been rising, the strong roads have found difficulty in getting capital to provide the additional main tracks, terminals, equipment and other facilities for handling the growing traffic.

One of the methods suggested for overcoming the difficulty arising from existence of strong and weak roads in competitive territory is by the consolidation of all railroads into a few systems.

The outstanding necessity confronting Congress and the task before it, as I understand, is to enact legislation that will restore the confidence of investors and establish the credit of the carriers, so that the money necessary to provide and keep up the railroad facilities of the country may be obtained.

The advocates of consolidation, however, fail to point out how their plan will accomplish this object.

For example, it is not apparent how the credit of the New York Central, or the Pennsylvania, or the Chicago Northwestern, or the Burlington, or the Union Pacific, or the Atlantic Coast Line would be improved by merging them with their poor and unprofitable neighbors and rivals.

Instead of improving the credit of the weak road the only effect of the project, as it appears to me, would be to impair the credit of the strong road.

The inevitable effect would be to reduce the average of the credit of all the railroads.

Credit of the Strong Roads None Too Good

The credit of the strongest of these roads has not been any too good during the last ten years.

Their credit needs support even more than the weak roads, because they have greater responsibility and greater burdens to bear.

They must provide facilities for the increased traffic they serve, which inevitably goes to them in times of stress.

Such credit as they now have is due to their ability to pay dividends. Falling rates and mounting expenses and the policy of state and national regulations increasingly menaced the stability of dividends, and thus weakened the credit of the strong roads.

* * *

It seems to be assumed that the strong roads have been earning, in excess of what they are legally entitled to earn, an amount sufficient to make up for the inadequate earnings of the weak roads, and that when the properties are consolidated and the earnings of the group thus pooled, the average will provide credit for all.

But this is a fallacy which can be demonstrated at the proper time. In any event, the earnings represent a value which must be paid for by the consolidated corporation when it acquires the properties.

Congress undoubtedly can acquire any or all the railroads of the United States for the government. It may also create corporations with power to acquire them, and consequently it may create several corporations to acquire all the roads in a prescribed territory, or certain specified railroads.

But Congress has no right to compel one corporation to consolidate with another.

It may give one the right to acquire the property of the other by condemnation, but it must pay for it, and (here is the difficulty) pay for it in cash.

Congress has no power to compel the stockholder of the railroads to be absorbed, to accept in exchange the stock of one of the dozen or more companies which are to absorb. When these absorbing companies acquire the railroads assigned to them, they must pay the value in cash to all who demand cash.

Whether this will be few or many, no one knows. It is

certain that many will demand cash; and then it must be provided if the transaction is to be accomplished.

The "underwriting" of a fabulous amount must be provided. Since no one will know in advance how many will demand cash instead of new securities, the underwriting must be for the entire amount.

Will Congress appropriate the billions necessary? Have we bankers enough to provide the money except through a series of years? And what will happen to the financial welfare of the country in the meantime, and what will the money cost?

I may add, though perhaps not relevant to the main point I am discussing, that my judgment is against the consolidation of all the railroads of the country into a few companies, say from ten to thirty, because I believe the companies would be too large and unwieldy for efficient and economical management.

Suggested Consolidations Too Big

I believe that railroad executives generally will agree that railroad systems may be made too big—that there are limits beyond which a railroad system should not, in the interest of economy and efficiency, be extended by consolidation with or acquisition of other lines. I am very confident that this is true.

More important still, consolidation should not be arbitrary. Each should be for a definite purpose and, where the government regulates, for a definite public benefit.

I am entirely in accord with the policy of removing some of the restrictions and permitting consolidations, subject always to approval, after hearing, by the Interstate Commerce Commission.

I believe that the absorption of some of the weak lines by the strong lines, upon fair terms, should be promoted. But competition in service and facilities should not only be preserved, but should be extended, and no consolidation should be permitted which in substantial degree eliminates such competition.

I believe that the existing railroad systems should be taken as a basis, and such consolidation as is desirable should be built up on that basis. This would avoid the insuperable financial difficulty already mentioned, and the disorganization of existing relations, and the disturbance of the billions of securities already outstanding.

The Pooling of Net Earnings

Another and much advertised and discussed method for solving the problem presented by the existence of financially strong and weak lines in the same locality is, in substance, that the Interstate Commerce Commission shall divide the railroads of the country into territorial or traffic groups and take the "Property Investment" account or book value of all the railroads in each group, and establish rates for that group sufficient to yield say six per cent., or some other specified return, on such investment or book value of each group.

Undoubtedly this would result in a much higher yield than the average, for the efficient roads, and much lower than the average for the inefficient, just as has always been the case in the past.

But it is proposed, as a part of this plan, that the most efficient roads shall be limited to the average, and their earnings in excess of the average, shall be set aside for the benefit, in some form, of the unprofitable roads that earn less.

The method of distributing the fund between the different roads varies with the different suggestions, but all contemplate that the law shall limit the earnings of the prosperous roads and increase the earnings of the poor roads.

The advocates of the plan may argue that they do not intend to take any value away from the strong roads except those whose earnings are "excessive," but that the earnings of the weak roads will be provided by increasing rates under an adjustment that will give all the increase to the weak roads.

But many of the roads are already earning in excess of six per cent., the average rate suggested; and obviously the plan proposes to take this excess from the stockholders of the roads earning it for the benefit of the security holders of the weaker roads.

However disguised and in spite of all the refinement of draughtsmanship and legal expression, the substantial object sought is to take, directly or indirectly, from the stockholders of the prosperous roads net earnings of their properties and give the same to the security holders of the weak roads.

Let us consider first who is to suffer and who is to benefit by this arrangement.

The stocks of the prosperous roads—that is, dividend payers—are widely scattered. They afford the only income, and literally the only means of subsistence, of hundreds of thousands of people in this country. They are thus held because they pay dividends.

The poor, who require a return from their savings and who must have some income, cannot and generally do not buy railroad stocks that have not paid dividends.

Who Would Benefit By This Plan

The stocks of the inefficient roads most generally, I believe, are held by small groups, very often by syndicates that accumulated them for speculation, or got them in some reorganization and are holding them with the hope that something will turn up that will let them out without loss, or give them a speculative profit.

Some of the schemes that have been proposed will afford this longed for opportunity to many a weary speculator in inferior railroad securities, but will be very discouraging to the multitude, including a great many women, who have invested their small means in high-class railroad stocks for an income on which to live.

But, I submit that Congress is without power to take the net earnings belonging to the stockholders of one railroad company for the benefit of the security holders of another railroad company.

The Plan Violates the Constitutional Guaranty

The regulation of the business and operations of the carriers and of the rates they shall charge is one thing: the seizure and appropriation of the net revenue of the carrier, realized under rates which the government prescribes, is a very different thing. One is within the power of Congress and the agencies that it creates; the other is the giving of one company's and one stockholder's property to another company and other stockholders against constitutional guaranty and without due process of law.

Those Who Are Most Vitally Concerned

It may seem old fashioned now to plead the Constitution against any action that is convenient and expedient, and especially to invoke it for the protection of property rights.

But I venture to urge its consideration in this behalf, not for the benefit of any rich railroad company, but for the hundreds of thousands of stockholders who look to dividends upon the stock of conservatively managed and prosperous railroads as their only means of support.

And it will not be a sufficient answer to the argument to say that it emanates from one who happens to be connected with a prosperous railroad company.

A Railroad Is Worth What It Will Earn

Now a railroad is worth what it will earn; and the average of its earnings during a series of average years ought

to be a fair guide under the conditions existing at the time.

If this is not taken, then there can be no hard and fast rule, and all the circumstances, some of which were enumerated by the Supreme Court in Smyth v. Ames (169 U. S. 466) must be taken into account.

A hard and fast rule would be convenient, but any that deprives the owner of the value of his property as reflected by its net earnings, is unjust and ought not to be adopted.

But the earnings of the property depend in large measure upon the rates the owner is allowed to charge, and it is suggested that these rates in turn may be fixed by the government; and that is true. Let us apply this to the present situation.

The securities of the good roads were bought and sold at high levels of prices, and the securities of the inferior roads were bought and sold at lower levels; and thus they are held by investors today.

The prices of these securities are the evidence of the popular judgment of the relative value of these railroads, and are the best evidence of such value. These values were based upon the earnings of the railroads under the rates they were allowed by law to charge.

As a matter of common sense, as well as plain justice, what better evidence of the value of these railroads, and of one railroad as compared with another, is possible?

How can the government, consistently with fair dealing, question the value of the railroads as demonstrated through many years by rates established by or under the regulation of its own agencies?

It is upon such considerations as these, and the values established under earnings from rates prescribed or sanctioned by law for years, that rates must be based, and not upon book value, reproduction cost, or any other mere theory. It is the practical situation and existing status that should be dealt with.

Why venture into new fields for rate-making and seek to disturb and unsettle not merely the value of the securities involved, but the business and commerce of the country, which have become adjusted to and in fact made, the present system of rates?

Why not continue the present adjustment of rates, and make such increases as necessary to meet the increased cost of recent years and provide a return on the new capital that has been put into properties in such enormous amounts, and which must be provided for the future, leaving the Interstate Commerce Commission free to reconsider and review rates from time to time, so as to adjust the revenue to the changing expense of operation, the rise and fall of wages and prices, and the expenditure of new capital?

A Guaranty By the Government

Many financiers and railroad men believe that a guaranty of dividends or some definite return on the money invested in railroads is necessary in order to re-establish faith in the railroad securities now constituting such an important part of our financial structure, and induce the investment of the additional capital necessary to provide the railroad facilities which are required.

This leads to the consideration of the question of a guaranty by the government.

Undoubtedly the guaranty by the government of a reasonable return upon the full value of railroad property would be satisfactory to those who consider the problem only from the standpoint of the investor.

But that is impracticable, because it is not believed that the government, as a permanent policy, would guarantee the railroad owners a fair return upon the full value of their property and leave the management in their hands, taking all of the risk and none of the profits: whereas, if the government should take the excess above the guaranty, then it would cease to be a guaranty, and all incentive to competition and economy by the private management would be eliminated. I fancy that the people would prefer to come directly to government ownership, unpopular though it is.

It has been urged, however, that a small return—something less than the full value—should be guaranteed in order to furnish the company financial credit, while still leaving the incentive to competition and economy. I am afraid that plan would not accomplish the object.

The guaranty of a return of two or three or four per cent. upon the value of a railroad might be comforting to the first mortgage bondholders, or the holders of other bonds now outstanding, who would have the first claim upon the fund. But how would it help the corporation to raise more money, which is the object desired?

Of what benefit would a government guaranty of two or three or even four per cent. upon the value of the Pennsylvania, or the New York Central, or the Baltimore & Ohio or the Rock Island Railroad, or most other railroads, be to those companies?

How would it assist them in raising money, since the guaranty would not be sufficient to pay the interest on bonds already outstanding and secured by prior liens?

It would make doubly secure what is already abundantly secured. But it would afford no collateral for new issues nor secure new loans. On the contrary, I believe it would be distinctly detrimental to the company in securing new money, because of the inevitable tendency that such guaranty would have to prompt government officials to interfere and endeavor to shape the policy of the company to extreme conservatism, in order to guard against the possibility of the government being called upon to meet the guaranty.

Moreover, as time passed, the public would be more and more inclined to regard the amount of the guaranty as the measure of the return to which the railroad company was entitled, and in every rate hearing the government guaranty would be dwelt upon by those opposing increases or seeking reductions in rates as the government's judgment of what the company was entitled to earn.

(To Be Continued.)

Cummins Bill Delayed

THE HOUSE COMMITTEE is displaying no alacrity to report favorably the Cummins bill, passed by the Senate, to restore the Interstate Commerce Commission's former authority over rate-making during the remaining period of federal control and the arguments made before the committee by Commissioner Clark and Director General Hines made such an impression on the committee that it is reported there is a good chance of its being killed in committee. Hearings on the bill were concluded on June 27 but the committee has not yet reached an agreement on it and its time is now being taken up with the hearings on the general railroad question. Commissioner Clark did not oppose the bill but indicated plainly that the commission was not asking for it and did not believe it necessary. Mr. Hines treated the matter as being of no great importance but declared that it would be wrong policy to divide the responsibility for rates at this time.

Senator Cummins was so anxious to get the bill through that he had it passed without any hearings and so hurriedly that both Mr. Hines and Mr. Clark told the committee it would have to be redrafted to make it mean what it was intended to mean.

The Senate sub-committee appointed to draft a tentative railroad bill has held several sessions giving preliminary consideration to the subject and it is understood that it has now reached the point of beginning to frame a bill along the lines of Senator Cummins' ideas of a guaranty. Some hearings are to be held later.

General News Department

A bill to appropriate $17,000,000 additional for the construction of the government railroad in Alaska has been introduced in the Senate by Senator New.

About half a mile of copper wire, part of a telegraph line of the Western Union Company on the New York Central, in Tonawanda, N. Y., was cut down and carried off by thieves one night last week.

An intoxicated man boarded a locomotive in the Baltimore & Ohio yards at Pittsburgh, Pa., on June 28 and opened the throttle. The engine headed out on one of the lead tracks where it collided with another engine, doing considerable damage. The man was arrested and later sentenced to a term of 90 days in the county work house.

Major Mark S. Watson, who served through the war as assistant chief of the press section of the general staff at American army headquarters in France, has been appointed special assistant on the staff of Thomas De Witt Cuyler, chairman of the Association of Railway Executives. Major Watson has recently been in England making a study of the financial and legislative problems that have grown out of the war control of the English railway lines.

Vacations for railroad clerks have not been entirely cut off. According to general order No. 27, as interpreted several weeks ago, clerks were not allowed the time-honored two weeks' vacation except they were willing to have their pay suspended; but, according to the Nashville Banner, a new interpretation, No. 16, has been made known to clerks in that city and it is to the effect that wherever vacations have been given in former years the prevailing practice will be continued. In most of the large offices clerks receive two weeks off with pay.

Three hundred railroad shopmen, delegates from local unions said to aggregate 28,000 members, held a three-day conference at Atlanta, Ga., last week to formulate plans for asking the Railroad Administration for increases in pay and shorter working hours. The Brotherhood of Railway Clerks on the Southern Railway has laid before the Railroad Administration a proposed new contract, calling for 20 per cent higher wages, a working week of 44 hours, and a provision allowing time and on-half for all overtime beyond ten hours a day. The minimum pay of clerks at present is $87.50 a month.

Representatives of the coal operators, as part of their propaganda to induce the early buying of coal, are already complaining of an impending car shortage and are urging the Railroad Administration to take more active steps to put cars in repair. The directors of the National Coal Association in resolutions recently adopted, declare serious car shortages exist, and that there is an abnormally large number of cars out of service awaiting repairs. George H. Cushing, managing director of the American Wholesale Coal Association, testified at Washington on July 18 before a House committee that there are many idle coal cars in all parts of the country which should be repaired.

The Brotherhood of Locomotive Firemen and Enginemen closed its 36-day triennial convention at Denver, Colo., on July 15. Among the most important resolutions passed were those favoring the municipal market system for reducing the high cost of living, recommending the establishment of a labor party and press in the United States, federal control of the railroads, raising insurance of the order to $4,500, approving standard wages for railroad men employed in France, endorsing the League of Nations, favoring new immigration laws excluding foreigners for a term of years, asking the President to use his influence to release Eugene V. Debs and Thomas J. Mooney, and seeking better working conditions for brotherhood members. Among the men of national prominence who addressed the convention were Director General Walker D. Hines and Governor Henry J. Allen, of Kansas.

On July 21 the City Council of Chicago by a vote of 66 to 2 adopted the enabling ordinance for a new passenger terminal, to be built by the Illinois Central at Chicago. This great project, which is estimated to involve an expenditure on the part of the railroad of over $88,000,000, was described in the *Railway Age* of July 11, page 51. One of the important features of the plan is provision for electrification of the suburban service of the road within seven years, other branches of the service to be transformed to electrical operation in subsequent periods. Following the placing of the mayor's signature on this ordinance it must be submitted to the United States War Department for ratification with respect to lake front developments, which contemplate an outer harbor and an extensive park system.

Air Mail Declared a Success—Rate Reduced

The postmaster general has fixed the rate of postage on mail carried by aeroplanes at two cents an ounce, the regular postage rate for first-class matter, placing the air mail service on the same footing as other means of transportation. He says that the experiments of the past year have demonstrated possibilities beyond expectations. By the use of the Liberty engines now available from the War Department, 10,000 letters a day for San Francisco and other points on the Pacific Coast which fail to connect with the westbound 8:40 p. m. train out of New York are being advanced 24 hours daily to their points of destination. Mail from New York that did not catch the 5:15 p. m. train for the West is now being delivered in Chicago in the afternoon instead of the second morning. Arrangements are being made to place on the New York-Washington route the three fastest aeroplanes in the air mail service, each having a capacity of 18,000 letters and a maximum speed in calm weather of 132 miles an hour.

The following statement says, further: "The great saving of time now effected over the fastest railroad train between New York and Chicago will enable the department to make a saving in car space of more than twice the cost of the operation of an air mail service on that route."

Master Blacksmiths' Convention

The International Railroad Master Blacksmiths' Association has announced the following papers which are to be presented at the convention to be held at the Hotel Sherman, Chicago, August 19-21. Repairs to Locomotive Frames, P. Lavender (N. & W.), chairman; Drop Forging and Its Possibilities, J. D. Boyle (Anderson Drop Forge Company), chairman; Heat Treatment of Iron and Steel, Purposes and Results, Geo. Hutton (N. Y. C.), chairman; Why Railroads Should Adopt Specific Standard Safety Appliances to Comply with U. S. Standards, J. E. Dugan (U. P.), chairman; Making and Repairing Springs, J. W. Russell (Penn.), chairman; Up-to-Date Smith Shop, G. Fraser (A., T. & S. F.), chairman; Scrap Reclaiming by Use of the Oxy-Acetylene and Electric Cutting and Welding Process and Other Methods, Walter Constance (St. L.-S. F.), chairman; the Treatment and Results of Carbon, High Speed and Other Alloy Tool and Tool Steels for Tools, J. H. De Arment (Penn.), chairman; A Modern Hammer and Hydraulic Forge Shop, R. F. Scott (P. & R.), chairman. The officers of the association are: President, W. C. Scofield (I. C.), chairman executive committee, W. J. Mayer (M. C.); first vice-president, J. Carruthers (D. M. & N.); second vice-president, G. P. White (M. K. & T.); secretary, A. L. Woodworth (B. & O.); assistant secretary, C. W. Schafer (C. of Ga.).

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY, 1919

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Fort Worth & Rio Grande	235	$65,592	$43,726	$117,529	$23,755	$17,553	$1,763	$58,061	$6,328	$107,462	91.43	$10,068	$2,983	$7,084	$11,045
Galveston, Harrisburg & San Ant.	138	1,189,643	448,738	1,724,307	239,551	366,753	17,399	662,387	56,463	1,356,978	78.69	367,329	55,641	311,469	—138,295
Galveston Wharf	13	.....	.....	62,184	36,547	—124	24	23,500	1,876	69,922	112.44	—7,738	12,300	—20,038	—45,418
Georgia R. R.	328	325,850	104,672	463,403	50,573	82,834	6,820	243,606	15,487	399,489	86.21	63,914	5,950	57,927	—80,613
Georgia, Southern & Fla.	402	224,208	74,238	325,235	76,702	94,019	6,194	156,740	12,786	347,043	106.70	—21,808	13,550	—35,275	—77,608
Georgia & Florida	348	45,794	16,845	67,034	33,969	23,921	1,755	55,505	5,716	120,966	180.45	—53,932	4,200	—58,180	—36,964
Grand Trunk Western	1,001	1,438,849	308,075	1,884,693	221,081	354,642	21,122	754,858	48,998	1,403,511	74.46	481,182	51,396	429,763	338,819
Grand Rapids & Indiana	569	441,687	140,875	638,728	110,260	142,485	10,851	310,065	20,858	595,778	93.27	42,950	25,951	16,986	—49,180
Great Northern	8,252	6,300,636	1,410,054	8,474,020	2,288,449	1,234,280	63,247	3,379,708	144,798	7,209,073	85.07	1,264,947	552,837	711,276	438,609
Gulf & Ship Island	307	141,441	45,319	204,974	63,772	46,811	4,106	85,061	9,704	209,913	102.41	—4,939	11,558	—16,529	—75,762
Gulf, Colorado & Santa Fe	1,937	1,055,519	407,723	1,548,262	389,514	337,198	17,620	719,598	58,731	1,521,825	98.29	26,437	71,168	—44,994	—279,049
Grand Trunk Lines in New England	172	154,546	30,345	236,617	128,533	37,280	2,872	193,757	11,123	401,402	169.64	—164,784	11,500	—176,284	—136,558
Gulf, Mobile & Northern	424	197,438	43,833	251,791	59,629	53,361	5,299	100,621	8,854	227,764	90.45	24,028	11,642	12,200	—47,381
Hocking Valley	350	955,142	91,171	1,122,764	90,216	305,988	5,544	365,020	21,119	787,795	70.17	334,969	57,067	277,902	4,438
Houston & Texas Central	847	495,023	216,804	750,930	128,146	151,715	6,698	331,291	20,219	637,577	84.90	113,353	36,197	77,086	—89,379
Houston, East & West Texas	190	142,372	40,449	191,842	40,693	22,512	897	94,779	4,074	162,956	84.94	28,886	6,609	22,203	—15,866
Illinois Central	4,787	6,491,346	1,909,414	9,001,861	1,464,619	2,130,039	70,534	3,533,341	206,768	7,438,492	82.63	1,563,369	371,003	1,191,404	—44,399
Indiana Harbor Belt	116	.....	.....	496,169	82,931	101,908	1,634	352,711	19,072	558,256	112.51	—62,086	9,954	—72,041	—78,952
International & Great Northern	1,159	934,061	243,520	1,245,946	275,662	301,330	14,858	611,400	42,533	1,252,212	100.50	—6,266	30,000	—36,531	—219,417
Kanawha & Michigan	176	384,234	54,110	449,836	60,369	130,441	1,956	143,590	12,158	348,514	77.47	101,322	17,885	83,433	—106,068
Kansas City, Mex. & Orient	272	94,290	16,353	115,634	49,483	34,166	1,278	62,966	7,181	155,014	134.05	—39,380	6,269	—45,649	—11,089
Kansas City, Mexico & Orient of Texas.	465	66,824	12,754	84,710	34,844	28,121	1,666	55,746	7,728	128,040	151.15	—43,330	5,000	—48,330	—32,368
Kansas City Southern	774	960,968	171,851	1,238,016	208,157	269,555	18,479	493,485	42,820	1,030,932	83.27	207,084	61,250	145,612	—225,622
Kansas City Terminal	27	.....	.....	106,678	18,001	24,374	.....	50,467	1,446	95,319	89.35	11,358	20,500	—8,838	—32,197
Lake Erie & Western	902	635,120	72,726	742,298	137,958	263,947	12,582	338,810	23,754	777,017	104.67	—34,719	28,500	—63,286	—176,949
Lake Superior & Ishpeming R. R.	34	101,078	173	111,768	24,355	17,308	191	18,456	2,674	62,984	56.35	48,784	5,183	43,601	—19,883
Lehigh & Hudson River	96	200,709	3,652	212,545	27,582	39,065	1,559	87,396	5,026	160,629	75.57	51,916	5,400	46,516	11,425
Lehigh & New England	234	233,850	1,496	345,415	46,414	58,405	3,222	115,675	9,555	233,271	67.53	112,144	8,610	103,534	—7,553
Lehigh Valley	1,435	4,142,357	613,211	5,291,552	852,685	1,330,974	39,218	2,595,444	113,611	4,950,356	76.74	341,196	146,725	194,328	—1,210,148
Long Island R. R.	398	514,329	1,628,229	2,328,055	274,555	361,520	12,229	996,255	48,151	1,705,768	73.27	622,287	85,804	536,345	—156,861
Los Angeles & Salt Lake	1,168	994,087	517,572	1,395,316	271,326	345,906	22,845	492,021	30,286	1,200,548	86.04	194,768	67,235	127,237	—110,692
Louisiana Ry. & Navigation	349	209,114	32,324	267,456	96,483	48,439	3,780	144,064	8,342	271,108	101.36	—3,652	14,000	—17,668	—52,510
Louisiana & Arkansas	302	142,479	33,753	181,365	32,498	61,905	4,134	77,597	6,208	182,162	100.43	—797	11,204	—12,002	—33,841
Louisiana Western	207	260,479	104,220	381,793	74,525	66,826	4,355	122,090	10,432	280,225	73.39	101,568	9,069	92,479	—307,473
Louisville & Nashville	5,013	6,014,630	1,963,441	8,411,506	1,365,613	2,199,515	115,637	3,581,875	180,282	7,469,972	88.81	941,533	260,771	679,754	—810,712
Louisville, Henderson & St. L.	199	200,800	68,541	279,689	44,295	42,136	4,276	118,606	7,342	216,650	77.46	63,039	4,000	58,987	6,437
Maine Central	1,216	835,627	381,182	1,304,251	293,055	260,623	11,119	698,865	34,274	1,299,087	99.60	5,164	75,623	—70,467	—250,060
Maryland, Delaware & Va.	82	71,169	28,949	102,870	13,216	22,303	782	76,921	2,101	115,323	112.11	—12,453	1,733	—14,186	17,424
Michigan Central	1,861	3,946,168	1,697,921	6,166,490	853,697	1,148,306	67,346	2,615,110	111,856	4,862,968	78.86	1,303,522	150,000	1,152,872	—307,473
Midland Valley	388	226,682	79,310	314,634	70,658	47,966	2,326	109,498	11,378	241,795	76.84	72,831	6,876	66,037	—23,739
Mineral Range	101	49,660	350	52,468	14,186	26,642	502	35,313	983	77,693	148.07	—25,224	3,300	—28,524	—31,636
Minneapolis & St. Louis	1,646	790,472	206,719	1,050,360	162,828	266,522	11,460	495,553	29,605	966,568	92.02	83,792	50,301	33,249	76,294
Minn., St. Paul & Sault Ste. Marie	4,243	2,528,172	574,061	3,313,120	661,659	697,302	28,291	1,388,644	72,240	2,870,647	86.64	442,473	186,418	255,779	609,021
Minnesota & International	194	68,985	20,986	95,099	33,986	17,250	474	49,826	3,442	104,977	110.38	—9,878	5,890	—15,778	—14,738
Mississippi Central	164	56,639	29,011	88,553	25,777	31,666	1,013	35,275	5,607	99,337	112.17	—10,784	3,325	—14,109	—21,106
Missouri & North Arkansas	305	70,135	32,113	109,489	55,503	34,943	1,990	60,529	11,331	164,298	150.05	—54,809	6,242	—61,310	—49,899
Missouri, Kansas & Texas R. R.	1,713	1,942,721	612,302	2,702,458	411,163	909,523	29,005	936,648	76,095	2,370,286	87.07	332,171	89,512	242,240	—144,717
Missouri, Oklahoma & Gulf	332	81,482	16,891	104,063	54,332	57,756	1,894	68,860	7,243	190,346	182.91	—86,283	8,510	—94,857	—48,634
Missouri Pacific	7,100	5,077,729	1,629,740	7,194,940	1,406,258	1,625,704	87,282	2,943,137	201,932	6,310,478	87.70	884,463	266,393	614,459	—480,173
Missouri, Kansas & Texas Ry. of Texas.	1,796	1,338,518	598,291	2,018,971	480,464	377,875	30,764	1,019,877	76,548	2,003,858	99.25	78,113	47,828	29,779	31,888
Montour R. R.	54	119,924	1,299	123,947	41,644	63,176	1,277	26,974	6,965	140,037	112.98	—16,090	2,286	—18,376	—23,094
Mobile & Ohio	907	1,004,963	172,848	1,241,280	231,288	382,314	22,847	604,296	40,663	1,281,222	103.22	—39,942	55,174	—95,136	—232,155
Monongahela Ry.	108	253,401	20,418	276,451	83,721	41,645	530	85,116	7,527	218,538	79.05	57,913	5,000	52,913	—81,805
Monongahela Connecting	6	.....	.....	73,051	11,663	34,058	511	38,147	7,866	92,214	126.23	—19,162	2,566	—21,928	—67,760
Morgan's Louisiana & Texas R. R.	400	444,640	166,798	654,506	110,048	124,420	8,256	275,104	20,750	540,495	82.58	114,011	31,034	82,871	—114,195
Nashville, Chatt. & St. L.	1,247	1,063,719	419,918	1,584,851	229,513	490,845	33,789	691,170	42,529	1,494,842	94.32	90,009	50,000	39,106	—239,754
Nevada Northern	168	125,446	8,941	139,562	23,470	24,028	775	35,365	4,109	87,850	62.94	51,712	18,323	33,388	—38,834
New Orleans & N. E.	399	353,264	130,822	545,555	85,866	143,445	7,331	234,303	16,387	491,315	90.06	54,239	28,357	25,648	—110,451
New Orleans Great Northern	284	113,665	42,258	164,011	41,563	47,688	2,076	77,244	8,126	176,941	107.88	—12,930	9,000	—22,024	—81,435
New Orleans, Texas & Mex.	191	145,407	33,851	185,421	45,723	32,122	3,304	60,444	5,186	148,967	80.33	36,454	10,000	26,443	—14,322
New York Central	6,075	14,777,299	6,277,502	24,005,604	3,595,646	5,146,005	248,086	10,463,045	631,347	20,433,037	85.11	3,572,567	1,140,370	2,430,994	—1,899,486
New York, Chicago & St. L.	574	1,715,367	200,726	1,962,284	250,072	337,093	28,086	876,379	51,495	1,546,995	78.83	415,289	55,000	360,285	—62,454
New York, N. H. & Hart.	1,965	3,950,641	3,571,437	8,507,620	1,371,108	1,654,286	41,451	3,977,834	249,460	7,436,679	87.41	1,070,942	268,000	800,854	—919,942
New York, Ont. & Western	569	617,336	178,933	950,005	131,557	183,909	8,079	398,709	21,741	743,996	78.31	206,010	27,000	179,010	133,620
New York, Phila. & Norfolk	121	471,500	98,329	607,544	55,025	164,244	7,269	330,154	11,328	585,114	96.31	22,430	17,100	5,329	—180,356
New York, Susq. & Western	135	227,156	53,831	335,664	9,215	50,114	3,096	200,010	8,490	270,878	80.69	64,785	37,111	27,635	—59,357
Newburgh & South Shore	7	.....	.....	151,348	21,256	29,908	.....	65,204	3,761	120,130	79.37	31,218	8,388	22,831	—11,270
Norfolk Southern	907	336,010	137,935	501,723	90,004	86,810	8,155	270,704	22,027	479,049	95.48	22,674	20,000	2,654	—25,672
Norfolk & Western	2,088	4,780,216	837,097	5,925,050	953,249	1,702,527	35,798	2,193,347	113,579	5,008,988	84.53	916,062	26,000	655,862	—1,102,813
Northern Alabama	112	58,090	13,408	73,566	5,426	8,329	1,545	51,436	2,071	68,804	93.52	4,762	3,400	1,362	—34,467

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY, 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.					
Northern Pacific	6,567	$5,551,963	$1,457,973	$7,574,797	$2,025,868	$1,565,558	$88,229	$2,916,539	$185,399	$6,825,324	90.11	$749,473	$599,987	$147,388	—$1,214,358
Northwestern Pacific	507	269,344	215,338	545,247	93,704	69,084	4,386	208,730	12,473	388,922	71.32	156,325	22,090	134,413	—31,579
Oregon Short Line	2,347	2,174,567	559,837	2,926,556	606,546	459,527	17,092	836,081	85,051	2,063,351	70.50	863,205	177,964	685,131	—327,873
Oregon-Wash. R. R. & Nav.	2,670	1,494,457	530,307	2,172,879	472,609	326,652	27,121	829,884	98,788	1,770,214	81.46	402,666	113,614	288,404	—308,593
Panhandle & Santa Fe	772	330,317	88,558	438,965	97,444	176,349	2,977	212,675	13,937	503,145	114.62	—64,179	15,604	—79,841	—160,702
Pennsylvania R. R Western Lines	1,754	6,422,680	1,874,595	8,887,423	1,307,756	2,259,126	80,792	3,587,850	183,689	7,482,176	84.18	1,405,247	309,202	1,095,893	—186,734
Pennsylvania R. R. East	5,361	20,204,206	8,432,415	31,043,388	4,424,508	9,064,320	224,415	12,937,358	729,402	27,951,757	90.03	3,091,631	910,791	2,179,994	—3,838,916
Perkiomen	41	80,106	8,319	91,391	7,527	8,120	13	46,169	286	62,138	67.99	29,254	1,800	27,454	10,335
Pittsburgh & W. Va	63	79,707	9,691	107,987	74,916	37,896	1,104	48,889	5,069	177,203	164.10	—69,216	11,426	—80,642	—79,921
Pere Marquette	2,232	2,137,003	460,039	2,811,977	400,358	570,487	29,310	1,090,245	79,691	2,177,786	77.44	634,191	50,394	583,781	—115,667
Phila. & Reading	1,126	4,736,466	943,054	6,003,319	632,459	1,669,474	38,396	2,728,344	129,995	5,215,956	86.88	787,362	143,228	643,987	—1,243,426
Pitts. & Lake Erie	224	1,371,898	203,883	1,936,664	504,485	709,335	12,704	760,143	44,866	2,032,568	104.95	—97,904	75,500	—173,632	—1,155,321
Peoria & Pekin Union	19	36,588	3,888	105,701	19,584	51,622	881	64,139	4,999	141,224	133.61	—35,523	9,500	—45,023	—43,034
Phila., Bethlehem & N. England	71	.....	.....	57,114	6,189	19,436	346	36,823	922	63,708	111.54	—6,595	1,050	—7,645	—19,092
Pitts. & Shawmut	103	95,594	4,013	103,704	37,870	36,025	2,240	34,779	3,304	115,890	111.75	—12,186	979	—13,156	—17,017
Pitts., Cin., Chicago & St. Louis	2,383	4,620,889	1,842,886	7,135,402	1,003,342	2,311,024	92,453	3,465,458	173,676	7,119,365	99.77	16,037	246,021	—230,151	1,381,834
Pitts., Shawmut & Northern	204	67,754	5,354	76,470	25,930	54,542	929	33,295	10,522	125,220	163.75	—48,750	1,831	—50,581	—14,610
Port Reading	21	154,675	.....	232,284	14,476	9,749	18	87,029	363	111,633	48.05	120,651	9,000	111,651	53,748
Rich., Fred. & Pot	81	364,963	245,683	676,805	42,162	85,913	4,188	192,645	13,164	348,719	51.52	328,086	11,810	316 257	28,692
Quincy, Omaha & Kansas City	255	50,145	25,526	81,912	37,239	8,785	367	41,496	1,186	88,928	108.56	—7,016	3,003	—10,019	—567
Putland R. R.	415	233,987	97,193	406,007	78,281	97,202	5,480	189,793	11,038	382,999	94.33	23,007	19,204	3,803	—54,392
St. Joseph & Grand Island	258	152,191	36,368	200,955	44,452	29,711	1,787	113,298	11,853	201,101	100.07	—146	8,811	—8,957	—21,997
St. Louis, Brownsville & Mex.	548	2,980,680	1,274,089	451,038	80,070	82,188	5,194	123,986	13,224	304,661	67.53	146,377	10,000	136,247	63,521
St. Louis, Merchants Bridge Terminal	9	.....	443	225.921	64,199	35,204	745	157,046	5,428	262,622	116.24	—36,702	8.000	—44,702	—78,859
St. Louis-San Francisco	4,761	3,916,024	1,619,259	5,850,156	652,628	1,156,263	48,891	2,524,160	185,840	4,561,384	77.97	1,288,771	239,567	1,047,748	—20,654
St. Louis, San Francisco & Texas	134	81,710	12,852	100,933	20,933	14,331	2,145	62,764	5,374	105,292	104.31	—4,359	1,629	—5,987	—7,144
St. L. Southwestern	939	873,003	154,623	1.074,574	112,834	228,150	16,261	322,321	36,103	719,414	66.94	355,160	51,428	303,329	8,114
St. Louis Southwestern Ry. of Texas	814	368,781	104,520	504,228	114,138	166,284	8,457	266,705	22,354	577,780	114.58	—73,053	21,000	—94,087	—52,862
San Anto. & Aransas Pass	732	229,743	84,746	335,135	91,968	104,544	5,980	224,525	16,798	443,803	132.43	—108,668	15,000	—122,991	—46,244
Seaboard Air Lines	3,563	2,037,216	1,011,654	3,326,504	474,229	745,225	57,596	1,858,943	112,626	3,269,144	98.27	57,310	135,000	—78,019	—697,671
St. Louis Transfer	6	.....	.....	77,554	20,012	8,339	193	34,706	2,020	65,270	84.16	12,284	100	12,184	—9,984
South Buffalo	11	26,255	.....	52,399	2,289	14,699	346	40,596	1,426	59,355	113.27	—6,956	2,550	9,506	—91,260
Southern Pac. Steamship Lines	.....	663,937	56,226	764,829	6,967	140,143	11,707	601,111	35,604	795,532	104.01	—30,703	10,841	—41,545	—149,388
Southern Ry.	6,982	6,322,448	2,862,487	9,968,538	2,102,493	2,022,075	143,175	4,382,651	285,039	9,005,100	90.33	963,438	322,319	636,432	—2,501,127
Southern Ry. in Mississippi	278	89,979	41,254	140,486	26,934	8,414	2,830	78,419	4,071	120,668	85.89	19,818	9,000	10,818	7,289
Southern Pacific	7,049	8,781,097	3,384,241	13,114,867	2,468,745	2,582,269	111,869	4,951,448	279,189	10,688,933	81.51	2,425,934	596,656	1,825,711	—1,067,958
Spokane International Ry.	156	71,482	15,934	89,540	18,720	6,651	1,604	28,823	4,335	59,670	66.64	29,870	4,012	25,858	—12,225
Spokane, Portland & Seattle	554	375,229	126,350	541,022	92,847	85,620	5,379	213,515	19,820	419,677	77.57	121,345	59,200	62,069	—194,989
Staten Island Rapid Transit	23	91,337	85,502	202,501	36,651	29,515	834	103,825	8,704	179,529	88.65	22,972	9.000	13,972	—31,945
Tennessee Central	292	128,088	39,791	178,737	53,679	34,807	2,705	117,165	6,644	214,014	119.73	—35,276	5,135	—40,429	—108,023
Terminal R. R. Assn. of St. L.	36	.....	3,412	305,888	85,506	52,014	747	127,540	5,412	274,564	89.75	31,324	28,250	3,074	—78,908
Texarkana & Ft. Smith	87	78,819	15,144	103,681	17,636	10,494	3,178	50,387	3,158	84,729	81.72	18,952	6,458	12,486	25,735
Texas & New Orleans	469	444,999	155,936	661,365	128,520	182,715	4,492	243,884	14,020	607,599	91.87	53,765	23,436	31,242	—146,210
Texas & Pacific	1,946	2,142,398	751.071	3,037,133	340,969	574,351	21,629	1,242,416	68,203	2,270,053	74.74	767,080	84,971	681,281	186,999
Toledo & Ohio Central	435	716,514	62,081	817,142	153,187	214,924	5,628	347,551	16,278	740,314	90.59	76,828	31,055	45,772	—95,296
Toledo, Peoria & Western	247	56,492	50,630	114,829	26,441	25,910	2,107	70,377	5,377	130,207	113.39	—15,377	8,500	—23,877	—13,862
Toledo, St. L. & Western	454	528,382	37,857	596,806	114,299	111,136	4,877	280,187	11,886	521,726	87.41	75,080	26,000	49,080	—190,440
Trinity & Brazos Valley	368	74,537	17.277	96.245	31,152	41.204	2,175	62,159	7,441	144,130	149.75	—47,884	5,715	—53,598	—21,472
Ulster & Delaware	128	66,645	5,333	89,645	15,899	17,357	297	322,176	8,421	603,859	85.51	102,247	6.429	95,818	2,882
Union R. R.	35	.....	.....	706,105	85,440	187,525	1,179	63,576	3,145	101,621	113.35	—11,976	4,800	—16,776	—20,983
Union Pacific	3.614	5,989,845	1,874,252	8,422,271	1,372,884	1,532,172	38,584	2,331,569	225,835	5,702,911	67.71	2,719,361	275.322	2,443,372	—456,254
Utah Ry.	98	22,561	637	73,778	10,410	14,779	170	15,885	2,031	43,275	58.65	30,503	4,088	26,415	—20,923
Vicksburg, Shreveport & Pacific	171	146,929	73,174	235,370	45,266	61,657	2,484	102,610	7,850	222,377	94.47	12,993	9.242	3,738	—42,478
Virginian Ry.	523	885,993	52,669	1,051,220	138,199	198,362	5,110	318,641	17,145	679,912	64.67	371,308	35,700	335,608	30,495
Wabash	2,519	3,103,336	887,161	4,272,004	637,546	720,163	51,214	2,092,664	123,084	3,652,001	85.48	620,002	108.887	511,158	—154,213
Washington Southern	35	130,010	193,831	396.570	30,890	46,295	2,756	107,250	6,841	198,737	50.11	197,833	6,520	191,304	38,645
Western Ry. of Alabama	133	124,909	99,511	237,804	29,965	37,763	2,749	80,596	6,451	161,482	67.91	76,323	7,500	68,823	5,473
West Jersey & Seashore	361	270,709	541,033	870,298	193,892	157,078	7,475	447,128	21,900	832,768	85.69	37,530	49,888	—12,401	—113,162
Wheeling & Lake Erie	511	1,112,447	51,593	1,270,654	277,961	213,171	5,623	483,131	23,218	946,406	74.48	324,428	54,100	269,975	—2,141
Wichita Falls & N. W.	328	118,059	34,603	163,654	41,998	19,766	828	78,950	6,585	148,126	90.51	15,528	9,256	6,272	40,915
Western Md.	707	1,095,656	85,204	1,259,341	293,319	358,386	17,290	423,748	42,713	1,147,632	91.12	111,708	43,200	68,508	—117,733
Western Pac.	1,011	844,414	150,449	1,030,598	259,013	180.733	15,802	310,219	22,670	808,670	78.47	222,358	48,231	174,100	—58,591
Yazoo & Miss.	1,381	1,479,589	391,926	1,961,897	309,431	368,318	16,819	736,677	45,250	1,477,151	75.29	484,746	—2,764	487.484	166,545

REVENUES AND EXPENSES OF RAILWAYS

FIVE MONTHS OF CALENDAR YEAR 1919

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama & Vicksburg	141	$741.533	$294,360	$1,104,582	$187,422	$289,107	$8,774	$482,610	$42,151	$1,017,411	92.10	$87,170	$53,871	$33,208	—$161,045
Alabama Great Southern	312	2,979,520	871,860	4,075,880	499,340	1,138,985	66,031	1,764,289	88,600	3,515,051	86.24	560,829	122,891	437,689	—383,404
Ann Arbor	301	1,250,610	262,279	1,598,714	325,808	276,035	24,693	756,729	58,173	1,441,633	90.17	157,081	76,300	80,520	55,437
Arizona Eastern	377	1,219,917	230,830	1,561,281	423,635	250,341	9,093	515,631	30,034	1,248,784	79.98	312,497	81,410	230,976	—454,999
Atchison, Topeka & Santa Fe	8,635	44,624,389	16,975,488	64,737,466	9,780,402	15,554,346	685,633	24,429,753	1,299,696	51,593,801	79.69	13,143,665	2,692,438	10,435,945	—6,349,822
Atlanta & West Point	93	562,094	465,189	1,135,118	133,439	207,313	14,384	417,370	31,136	812,649	71.59	322,468	42,500	279,933	16,636
Atlanta, Birmingham & Atlantic	639	1,530,471	349,745	2,001,199	595,961	683,427	33,562	1,212,930	62,620	2,588,959	129.37	—586,760	80,000	—667,700	—624,778
Atlantic City	177	711,903	726,043	1,530,937	226,879	217,824	5,791	806,679	4,518	1,262,154	82.44	268,783	60,000	208,783	139,463
Atlantic Coast Line	4,846	17,722,618	8,529,507	27,955,311	3,924,380	5,780,499	293,630	12,107,816	557,616	22,825,599	81.65	5,129,713	1,030,000	4,092,153	—1,967,418
Baltimore & Ohio Chicago Terminal	91	.....	—18	621,190	173,153	225,492	5,291	624,462	51,109	1,102,404	177.46	—481,214	143,380	—624,628	—175,269
Baltimore & Ohio	5,151	46,649,979	12,750,380	64,526,635	10,764,941	22,374,229	771,544	31,563,103	1,966,690	67,946,218	105.29	—3,419,583	1,832,204	—5,258,344	—4,128,299
Baltimore, Chesapeake & Atlantic	87	346,033	152,860	516,785	60,475	105,543	4,755	339,348	17,359	527,481	102.06	—10,696	15,800	—26,496	—3,245
Bangor & Aroostook	632	1,769,296	368,550	2,238,329	436,999	553,283	19,449	901,018	65,818	2,003,169	89.49	235,160	105,000	129,820	—173,953
Beaumont, Sour Lake & Western	118	386,212	113,261	523,470	129,810	96,806	8,657	231,500	25,312	492,085	94.00	31,385	13,500	17,828	—250,992
Belt Ry. Co. of Chicago	311	.....	.....	1,268,808	115,944	259,760	1,786	884,702	39,397	1,301,589	102.58	—32,781	78,218	—110,999	—164,333
Bessemer & Lake Erie	217	4,018,252	166,312	4,319,664	436,536	1,551,640	52,739	1,592,366	98,560	3,691,162	85.45	628,502	72,500	555,916	221,852
Bingham & Garfield	37	473,938	11,599	508,500	168,072	197,257	6,968	150,115	22 501	552,751	108.70	—44,251	—34,830	—79,081	—643,372
Birmingham Southern	29	192,158	.....	266,091	18,611	34,865	3,414	116,268	15,991	189,149	71.08	76,942	13,174	63,769	38,629
Boston & Maine	2,258	14,987,296	8,097,460	25,925,473	3,614,568	5,549,649	188,418	15,261,237	864.153	25,642,046	98.91	283,427	869,466	—586,336	—1,464,401
Buffalo & Susquehanna R. R. Corp	296	760,465	35,976	828,251	194,244	409,315	8.845	305,509	37,759	956,672	115.51	—127,420	16,250	—143,670	—214,930
Buffalo, Rochester & Pittsburgh	589	4,637,461	605,950	5,437,515	881,889	1,981,085	72,870	2,815,438	166,724	5,927,672	109.01	—490,157	135,000	—625,599	—891,575
Canadian Pacific Lines in Maine	233	1,072,542	298,689	1,435,196	192,523	342,157	13,067	958,539	18,645	1,524,930	106.25	—89,734	55,000	—144,734	19,105
Carolina, Clinchfield & Ohio	282	2,086,052	150,569	2,277,127	413,912	628,697	42,736	735,627	65,166	1,865,786	81.93	411,340	81,500	329,828	—127,323
Central New England	301	2,329.809	119,447	2,574,376	595.860	533,555	12,845	1,288,155	75,454	2,511,270	97.54	63,106	80,000	—17,075	—342,489
Central of Georgia	1,918	5,087,546	2,418,164	8,374,459	1,648,293	1,839,930	166.713	3,695,120	292,219	7,634,541	91.16	739,917	282,437	455,498	—1,675,565
Central R. R. of New Jersey	685	12,301,127	2,981,135	16,641,812	2,100,034	4,618,994	107,303	8,315,817	414,249	15,639,083	93.97	1,002,729	787,323	215,251	—1,443,411
Central Vermont	411	1,183,062	317,025	1,645,304	214 850	460,580	24,110	1,111,544	72,056	1,884,392	114.53	—239,089	69,600	—308,808	—152,527
Charleston & Western Carolina	342	970,454	275,886	1,298,391	222,335	235,139	19,619	598,950	31,929	1,107,971	85.33	190,419	42,500	147,919	—99,433
Chesapeake & Ohio	2,498	20,612,912	5,898,616	28,066 218	4,363,956	6,353,570	182,930	11,028,787	564.596	22,657,705	80.72	5,408,513	854,841	4,550,600	—746,267
Chicago & Alton	1,050	1,918,170	2,406,121	9,892,886	1,639,560	2,690,866	130,564	4,396,228	245,155	9,152,964	92.52	739,923	283,057	456.023	—267,135
Chicago & Eastern Illinois	1,131	6,922,604	1,890,893	9,507,014	1,508,971	3,729,586	114,102	4,386,440	238,919	10,007,178	105.26	—500,164	397,592	—899,563	—1,339,621
Chicago & Erie	269	3,369,418	447,126	4,144,043	422,704	763,899	54,188	2,193,175	141.803	3,590,755	86.64	553,288	156,252	396,962	634,034
Chicago & North Western	8,090	33,129,171	12,694,636	50,069,947	7,660,290	11,293 508	257,947	24,738,274	1,216,155	45,685.505	91.24	4,384,442	2,375,000	2,005,562	—436,840
Chicago, Burlington & Quincy	9,372	39,568,545	12,530,833	56,265.550	8,697,034	11.218,701	439,156	23,068,836	1,573,372	45.589,883	81.02	10,675,666	2,198,323	8,458,842	—821,258
Chicago Great Western	1,496	5,174,568	2,267,451	8,026,633	1,401,983	2,018 758	131,358	3,768,684	222,332	7,606.725	94.76	419,908	288.040	131,173	—554,660
Chicago, Indianapolis & Louisville	657	3,057,413	1,071,000	4,522,882	536,216	1,095,733	64,817	1,941,612	127.222	3,808,703	84.21	714.179	170,992	542,961	243,113
Chicago Junction	12	.....	.....	1,378,651	389,251	251.160	497	1,137,178	38,452	1,816,538	131.77	—437,887	12,102	—449,989	—402,958
Chicago, Milwaukee & St. Paul	10,647	40,094,761	11,257,355	56,209,942	7,366,920	16,717,251	449.837	27,256,396	1,541,935	53,513,984	95.21	2,695,959	2,660,858	22,120	—1,227,693
Chicago, Peoria & St. Louis	247	478,401	117,897	636,852	191,494	315.013	13,387	395,709	46,192	961,790	151.02	—324,938	36,966	—361,918	—292,406
Chicago, Rock Island & Gulf	474	1,332,997	397,446	1,829,342	334,355	370,646	33,048	859,783	58,235	1,660.108	90.74	169,234	65,774	103,170	—437,616
Chicago, Rock Island & Pacific	7,592	26,744,373	11,135,047	40,295,542	7,094,764	10,048,789	484,117	18,477,044	1,010,663	37,286,895	92.53	3,008,648	1,741,533	1,264,324	—3,709,365
Chicago, St. Paul, Minn. & Omaha	1,749	6,836,082	2,779,109	10,354,732	1,271,656	1,959,613	101,513	5,068,759	294,860	8,773,605	84.73	1,581,127	514,927	1,064,327	202,279
Chicago, Terre Haute & Southeastern	374	1,413,872	106,550	1,555,467	260.502	744,026	17,393	606,128	42,599	1,679,070	107.94	—124,603	72,500	—196,120	—189,299
Cincinnati, Ind. & Western	321	773,327	247,236	1,132,959	231,353	345,328	22,669	640,983	63,858	1,306.557	115.32	—173.599	51,216	—224,814	—338,968
Cin., Lebanon & Northern	76	293,965	31,805	394,930	79,678	89,864	6,511	246,730	4,213	426,995	108.11	—32,065	21,443	—53,508	3,403
Cincinnati, New Orleans & Texas Pacific	337	5,066,313	1,514,941	6,922,737	809.964	2,216,193	112,544	2,474,365	164,235	5,820,116	84.07	1,102,621	195,715	903,315	—77,312
Cincinnati Northern	251	1,052,084	84,010	1,163,731	205,812	270,147	11,494	400,914	24,388	912,754	78.43	250,977	41.500	209,325	135,345
Cleveland, Cincinnati, Chic. & St. Louis	2,395	18,041,019	6,181,639	26,264,270	3,726,466	5,523,846	377,123	10,937,988	541,636	21,306,247	81.12	4,958,023	925,000	4,028,860	—692,890
Colorado & Southern	1,100	4,069,460	833,648	5,171,407	728,559	1,219,679	41,821	1,994,116	182,808	4,196,432	81.14	974,975	235,000	737,700	—443,911
Colorado & Wyoming	41	122,194	6,112	473,523	45,988	89,311	455	219,231	19,309	374,294	79.04	99,228	30,000	79,228	—29,919
Cumberland Valley	163	1,714,382	322,505	2,182,354	454,100	504,913	33,134	931,453	56,175	1,983,909	90.91	198,445	46,533	151.660	—465,019
Delaware & Hudson	875	11,227,037	1,083,829	13,063,947	1,817,896	3,871.555	90,471	6,169,268	538,010	12,651,716	96.84	412,231	300,000	106,238	1,312,044
Delaware, Lackawanna & Western	955	20,359,284	4,616,192	27,931,940	2,494,115	5,910,576	196,874	12,527,281	556,502	21,965.380	78.63	5,966,560	1,538,868	4,424,629	—882,057
Denver & Rio Grande	2,622	8,744,928	2,138,642	11,529,156	1,715.103	3,333,784	92,453	4,176,484	339,313	9,833,628	85.29	1,695,527	500.000	1,193,410	—1,204,433
Denver & Salt Lake	255	744,716	121,086	898,580	313.694	444.784	4,670	600,697	25,146	1,388,990	154.57	—490.410	45,000	—535,448	—203,235
Detroit & Mackinac	381	407.276	145 023	583.464	103,328	187.821	20,444	325,117	72,104	708,815	121.48	—125,351	33,762	—159,113	—172,995
Detroit & Toledo Shore Line	61	887,740	.....	910,836	71.949	71,004	2,765	257,639	13,111	415,880	45.65	494.956	52,996	441,953	87,420
Detroit, Toledo & Ironton	457	1,290,067	57,010	1.446.986	415,843	539,414	13,780	735,678	64,669	1,769,385	122.28	—322,399	42 932	—365,525	—32,693
Duluth & Iron Range	292	1,794,364	112,863	2.052,671	329,927	414,548	2,353	754,249	70,062	1,571.129	76.53	481,542	104.103	377,007	363,199
Duluth, Missabe & Northern	410	4,674,368	209,214	5,090.222	639.447	651,667	11,039	1,152,711	84,426	2,545.959	50.01	2 544.264	261,648	2.282,615	1,888,441
Duluth, South Shore & Atlantic	599	1,193,158	424,459	1,719 330	325.699	336,045	30,710	945,529	48,520	1,708,049	99.34	11,281	95.003	—83,757	—38,996
Duluth, Winnipeg & Pacific	178	685,432	120,013	835.128	124.532	162,174	11,473	385,320	40,958	730,090	87.42	105,038	43,341	61.695	17,881
East St. Louis Connecting	3	.....	.....	462,505	66,927	154,894	1.457	301,806	16,633	541,758	117.13	—79,253	13,111	—92,364	38,178
Elgin, Joliet & Eastern	826	7,543,512	37	8,791.618	762,746	2,143,729	32,381	3,322,093	128,202	6.388,713	72.66	2,402,905	264,647	2,138,258	1,065,288
El Paso & S. W.	1.027	4,100.658	869,537	5,233,846	632,131	987,315	47,508	1,439,829	125.641	3,267,145	62.42	1,966 701	284.354	1,681,952	—845,140
Erie R. R.	1,989	25,996.652	5,099,174	34,300,425	3,922,434	12,140,236	303,688	18,128,114	1,016,950	35,707,747	104.10	—1,407,323	1,242,672	—2,657,998	—352,414
Florida East Coast	764	2,548 099	1,602,089	4,656.586	760,474	831,913	41,137	2,187,313	92,558	3,969,443	85.24	687,143	180,269	506,613	—1,353,798
Fonda, Johnstown & Gloversville	88	143.068	310,999	471,488	48,713	44,677	2,655	189,279	24,139	309,464	65.63	162,025	24,500	137,525	—8,291
Fort Smith & Western	253	432,924	120,199	594,450	118,055	146,466	18,173	225,879	31,013	541,321	91.06	53,129	25,000	27,475	—6,063
Fort Worth & Denver City	454	2,858,963	1,105,137	4,146,492	463,148	823,006	23,968	1,556,989	125,232	3,005,117	72.47	1,141,376	96,250	1,044,367	359,743

REVENUES AND EXPENSES OF RAILWAYS

FIVE MONTHS OF CALENDAR YEAR 1919—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Fort Worth & Rio Grande	235	$279,925	$223,567	$541,183	$148,209	$123,639	$4,194	$335,931	$33,081	$645,055	119.19	—$103,872	$15,503	—$119,698	—$141,762
Galveston, Harrisburgh & San Ant	1,381	5,685,526	2,187,692	8,291,691	1,268,023	1,801,275	91,003	3,311,977	265,766	6,808,025	82.11	1,483,666	264,463	1,216,823	—1,241,922
Galveston Wharf	13	.....	.....	326,384	99,783	2,605	122	127,595	7,541	275,337	84.35	51,046	59,800	—8,754	—122,274
Georgia R. R.	328	1,632,702	742,911	2,557,018	275,058	408,027	35,166	1,196,451	82,095	1,997,653	78.12	559,365	30,751	528,560	—153,530
Georgia, Southern & Florida	402	1,163,988	503,655	1,821,663	332,781	448,842	30,448	852,823	50,962	1,697,658	93.19	124,004	67,950	55,965	—155,689
Georgia & Florida	348	287,820	89,666	401,312	142,124	94,290	10,027	253,847	27,759	528,046	131.57	—126,734	21,018	—148,527	—128,283
Grand Rapids & Ind	569	1,965,256	664,450	2,878,092	506,819	688,493	50,914	1,518,236	112,620	2,883,212	100.17	—5,119	128,601	—133,751	—273,897
Grand Trunk Western Lines	1,001	6,334,677	1,282,967	8,277,348	1,000,595	1,651,823	71,336	4,010,859	221,365	6,978,366	84.31	1,298,982	251,997	1,043,639	1,536,612
Great Northern	8,253	28,136,405	6,757,532	38,340,911	7,931,904	7,701,112	276,375	17,172,065	760,519	34,316,225	89.51	4,024,586	2,232,930	1,788,834	2,051,430
Gulf & Ship Island	307	638,679	205,327	926,659	287,840	216,476	18,334	388,084	43,501	956,138	103.18	—29,479	51,453	—81,013	—313,799
Gulf, Colorado & Santa Fe	1,933	5,019,426	1,905,560	7,326,799	1,619,826	1,315,175	68,447	3,254,441	242,151	6,488,163	88.55	848,636	355,838	479,469	—1,347,277
Grand Trunk Lines in New England	172	1,269,993	161,098	1,767,589	491,845	222,652	14,001	1,132,607	62,769	2,209,984	125.02	—442,395	57,500	—499,895	—202,838
Gulf, Mobile & Northern	424	765,107	200,256	1,020,224	224,463	281,068	25,295	496,502	48,136	1,075,502	105.41	—55,278	54,288	—109,812	—303,168
Hocking Valley	350	2,679,877	441,225	3,339,333	502,021	1,392,631	29,899	1,341,862	104,647	3,369,550	100.10	—30,216	285,333	—319,714	—538,591
Houston & Texas Central	847	2,233,310	939,925	3,363,467	661,897	671,572	37,779	1,511,397	96,430	2,977,183	88.51	386,284	172,292	212,661	—630,143
Houston, East & West Texas	190	678,174	199,704	919,945	172,369	118,504	4,288	432,873	21,144	749,174	81.43	170,766	31,243	139,034	—73,672
Illinois Central	4,787	29,412,673	4,441,082	41,774,656	7,493,644	11,245,028	368,400	18,221,444	1,130,652	38,628,087	92.47	3,146,580	2,002,006	1,136,556	—4,807,691
Indiana Harbor Belt	116	.....	.....	2,469,285	430,410	583,403	8,693	1,621,426	85,433	2,729,366	110.54	—260,080	—50,070	—310,153	35,128
International & Great Northern	1,159	3,967,925	1,184,117	5,506,511	1,385,748	1,537,014	65,910	2,902,128	195,263	6,114,826	111.04	—608,309	150,000	—759,098	—1,835,088
Kanasha & Michigan	176	1,197,385	289,635	1,546,550	238,200	596,663	11,671	621,146	62,210	1,529,891	98.92	16,658	89,425	—72,770	—434,482
Kansas City, Mex. & Orient	272	366,133	77,551	465,685	190,633	196,439	5,973	283,311	36,528	712,682	153.03	—246,997	31,301	—278,318	—125,34
Kansas City, Mexico & Orient of Texas	465	321,508	57,938	404,419	164,796	197,266	6,303	302,228	36,444	707,037	174.82	—302,617	24,906	—327,526	—274,431
Kansas City Southern	774	4,547,486	896,042	5,896,427	1,079,282	1,356,913	91,425	2,451,348	218,083	5,181,085	87.86	715,342	334,029	378,643	—1,442,860
Kansas City Terminal	26	.....	.....	517,334	68,302	131,934	.....	264,597	6,800	478,005	92.39	39,330	100,750	—61,471	—78,236
Lake Erie & Western	902	3,215,214	305,197	3,682,051	611,937	1,224,669	59,073	1,696,398	118,617	3,706,273	100.66	—24,221	134,000	—158,765	—575,415
Lake Superior & Ishpeming	34	123,135	1,271	138,645	89,746	93,765	985	36,539	12,695	253,779	183.04	—115,133	15,466	—130,599	—51,623
Lehigh & Hudson River	96	914,419	19,421	971,862	115,026	239,455	7,913	442,307	28,141	830,843	85.48	141,019	24,900	116,101	247
Lehigh & New England	228	1,191,899	8,192	1,283,849	209,439	293,138	12,894	499,206	45,865	1,060,303	82.58	223,546	43,051	180,495	—37,426
Lehigh Valley	1,435	18,943,067	2,503,378	23,840,381	3,290,043	6,714,330	196,941	11,926,629	525,036	22,133,270	95.35	1,107,111	733,625	373,168	—653,355
Long Island R. R.	398	2,198,646	5,811,440	8,888,688	1,330,504	1,475,823	54,901	4,669,144	233,757	7,836,361	88.16	1,052,326	446,268	603,932	—600,226
Los Angeles & Salt Lake	1,168	4,929,619	1,635,392	6,939,406	1,231,226	1,467,938	86,606	2,300,042	148,089	5,401,350	77.83	1,538,056	329,521	1,207,784	245,755
Louisiana Ry. & Navigation	549	1,148,864	176,603	1,403,373	396,086	258,983	19,057	759,588	38,469	1,471,982	104.83	—68,609	70,000	—138,740	—398,915
Louisiana & Arkansas	302	662,855	173,863	869,449	194,357	214,466	17,589	395,927	30,852	853,190	98.12	16,259	56,824	—40,595	—215,553
Louisiana Western	207	1,001,974	543,056	1,511,025	223,087	298,824	19,989	477,113	54,221	1,083,286	67.24	527,739	46,934	480,664	—318,881
Louisville & Nash	5,013	29,760,336	10,043,772	42,018,009	6,857,603	10,721,152	539,773	17,490,440	932,375	36,665,689	87.25	5,352,320	1,261,824	4,085,873	—3,172,755
Louisville, Henderson & St. L	199	852,497	297,105	1,194,085	256,538	168,531	32,594	485,188	36,697	979,549	82.03	214,536	20,000	194,124	—52,831
Maine Central	1,216	4,498,763	1,759,820	6,716,995	1,168,625	1,612,818	52,325	4,072,760	183,970	7,093,531	105.61	—376,534	378,116	—754,685	—549,688
Maryland, Delaware & Va	82	308,119	131,129	451,204	46,157	87,529	2,638	331,802	10,246	478,373	106.02	—27,170	8,665	—35,835	—8,597
Michigan Central	1,861	19,185,542	7,141,692	28,687,754	4,164,373	5,803,385	335,990	11,637,992	532,317	22,810,928	79.51	5,876,826	790,000	5,084,208	169,233
Midland Valley	387	1,101,878	385,225	1,550,247	324,378	277,082	11,713	580,647	61,385	1,255,206	80.96	295,041	34,814	259,761	—122,121
Mineral Range	101	362,998	2,337	376,039	51,647	115,928	2,243	209,250	4,998	384,190	102.16	—8,152	16,500	—24,652	—21,159
Minn. & International	195	318,652	115,852	456,275	103,648	78,206	2,574	250,858	17,695	452,961	99.27	3,313	23,834	—20,534	—67,563
Minneapolis & St. L	1,646	3,570,826	1,050,417	4,861,099	945,777	1,336,912	52,207	2,587,667	147,721	5,061,803	104.13	—200,703	259,246	—461,944	—735,833
Minneapolis, St. P. & Sault Ste. Marie	4,243	11,658,057	2,839,441	15,444,450	2,329,783	3,632,206	121,345	6,947,516	354,977	13,452,757	87.10	1,991,693	937,201	1,053,768	1,042,456
Mississippi Central	164	254,088	128,353	398,227	99,611	151,118	6,181	173,588	27,763	458,260	115.08	—60,033	16,625	—76,665	—186,042
Missouri & North Arkansas	365	380,047	172,804	590,677	331,586	195,681	9,465	301,711	41,116	878,896	148.79	—288,219	32,144	—320,988	—323,333
Missouri, Kansas & Texas Ry	1,714	9,035,137	3,086,632	12,805,946	2,595,284	3,940,093	118,770	4,695,004	383,342	11,768,920	91.90	1,037,026	450,936	585,936	—1,050,854
Missouri, Oklahoma & Gulf	332	387,301	84,996	503,113	240,279	237,351	8,594	533,560	34,307	855,164	169.97	—352,051	42,516	—395,049	—275,471
Missouri Pacific	7,108	24,466,571	7,816,980	34,666,489	7,144,122	8,376,797	402,610	15,325,881	1,006,197	32,418,218	93.51	2,248,271	1,331,965	903,588	—6,019,951
Missouri, Kansas & Texas Ry. of Texas	1,796	5,722,427	2,929,418	9,339,396	1,969,090	1,784,426	99,611	4,930,854	363,212	9,226,570	98.79	112,825	242,726	—132,395	—350,688
Montour R. R.	54	414,065	8,056	445,599	128,689	265,940	6,274	128,156	32,098	562,589	126.32	—116,989	11,458	—128,448	—69,242
Mobile & Ohio	995	4,761,000	887,748	5,976,955	1,059,503	2,125,044	115,710	2,895,998	193,748	6,396,317	107.01	—419,362	267,847	—687,703	—1,087,124
Monongahela	108	1,176,684	100,214	1,299,849	339,472	181,135	4,221	457,542	33,141	995,512	76.58	304,337	25,000	279,317	—30,751
Monongahela Connecting	6	.....	.....	734,184	117,490	275,423	2,562	399,975	35,395	830,844	113.16	—96,660	12,144	—108,804	—227,986
Morgan's Lou. & Texas R. R.	400	1,956,730	847,865	2,983,410	463,312	659,104	36,860	1,369,547	101,247	2,641,993	88.55	341,418	154,293	186,147	—981,881
Nash., Chatt. & St. L.	1,247	4,912,683	2,143,099	7,601,028	1,494,240	2,115,449	162,109	3,486,932	221,153	7,533,487	99.11	67,540	250,000	—183,939	—1,591,708
Nevada Northern	168	594,441	52,639	674,797	90,398	115,875	4,775	196,918	22,070	430,685	63.82	244,112	91,616	152,496	—287,364
New Orleans & Northeastern	398	1,686,031	563,601	2,541,088	374,946	659,368	39,074	1,275,987	71,611	2,447,023	96.29	94,064	141,785	—48,160	—670,937
New Orleans Great Northern	284	629,065	200,025	881,778	196,995	208,041	11,364	379,203	39,543	837,363	94.96	44,415	50,330	—6,348	—219,703
New Orleans, Texas & Mex	191	532,953	157,504	744,174	187,630	181,007	12,717	256,014	28,724	676,143	90 85	68,030	50,000	17,984	—316,352
New York Central	6,075	71,608,459	30,526,940	115,472,783	15,859,057	25,743,985	1,054,158	53,080,021	3,064,965	100,617,450	87.13	14,855,333	5,465,576	9,384,731	—2,729,110
New York, Chicago & St. L	573	8,925,942	853,280	10,037,945	1,240,583	1,867,286	130,159	4,073,198	260,704	7,587,823	75.59	2,450,121	275,000	2,174,752	1,250,854
New York, N. H. & Hart	1,965	17,260,287	16,855,493	38,570,274	5,393,004	8,553,096	201,795	20,344,962	1,323,827	36,554,311	94.77	2,015,963	1,340,000	666,666	—3,734,058
New York, Ont. & Western	569	2,415,121	590,648	3,662,273	558,314	1,071,898	41,232	1,864,044	117,722	3,653,210	99.75	9,063	125,800	—116,705	—383,755
New York, Phila. & Norfolk	121	2,254,004	589,905	3,061,405	268,621	670,003	41,519	1,488,762	56,383	2,612,583	85.33	448,822	85,821	363,000	104,149
Northern Alabama	112	401,579	64,120	479,446	109,476	33,816	6,664	317,319	9,184	476,326	99.34	3,119	17,000	—13 881	—148,512
New York, Susq. & Western	135	1,036,158	263,096	1,522,285	140,800	248,760	10,036	1,015,794	41,117	1,456,675	95.69	68,610	140,521	—72,021	—177,674
Newburgh & South Shore	7	.....	.....	704,797	92,264	138,765	.....	320.650	18,023	569,701	80.83	135,096	39,249	95,847	113,147
Norfolk Southern	907	1,690,889	657,186	2,519,960	533,499	551,996	37,486	1,279,051	103,043	2,508,066	99.52	11,894	99,872	—88,111	—386,799
Northern Pacific	6,566	27,807,864	7,150,578	37,524,437	6,646,595	7,051,815	305,211	14,597,764	937,995	29,902,909	79.68	7,621,528	2,800,522	4,814,184	—1,981,096

Traffic News

A trainload of peanut oil is the latest novelty in the freight transportation field. It is a shipment which, according to a press despatch, has started from Seattle, Wash., for Cincinnati, Ohio, consigned to the Proctor & Gamble Company, for use in making soap. This oil, 240,000 gallons, came from the Orient, and is to be followed by further shipments. Shiploads of bean oil and other like commodities are being brought across the Pacific.

The Shipping Brewers' Traffic Committee (Chicago) has asked the Omaha (Neb.) District Freight Traffic Committee for favorable freight rates on non-alcoholic beverages. The brewers say that considerable numbers of their trade are going to make non-alcoholic beverages, so as to utilize their plants; and their products should make new freight; for the transportation of these drinks in the past has been largely a local proposition. They expect that the quality of their goods, and their advertising, will create a wide demand.

The War Trade Board Section of the Department of State announces that export freight may now be consigned "to order" under special export license R.A.C.-77 and R.A.C.-42. Collectors of customs have been advised that it is no longer necessary for them to obtain the name of the actual consignee in the country of destination. Exporters desiring to consign to order shipments which do not fall within the terms of the above mentioned special export licenses may apply to the War Trade Board Section for individual export licenses.

The strike of marine firemen and other seamen in New York harbor continues, with no definite information from any source as to prospects of settlement. Coastwise freight traffic is the main interest affected, but the railroads and the trans-Atlantic steamships suffer because of the congestion in the harbor and of the large number of tugs out of service. Export freight is moved only under special permits, as for a long time past, and congestion of freight at the railroad terminals is prevented by withholding these permits in all cases where the tying up of vessels makes such action necessary.

The Board of Railway Commissioners, of Canada, has issued a favorable judgment on the application of the express companies of Canada for authority to make considerable increases in rates for the transportation of merchandise, first and second classes. Express rates in Western Canada and in British Columbia are now considerably higher than in Eastern Canada; the difference under the new tariff will be much smaller. Where there is no wagon service at either end of the route the charge must be 30 cents per 100 lb. less than the ordinary tariff, and where there is wagon service at one end of the route but not the other, the difference must be 15 cents.

A report on the export freight situation shows that as of July 9 at North Atlantic ports there were 11,426,714 bushels of grain in the elevators. There had been received during the week ended July 9 in the elevators 4,193,350 bushels, and there had been cleared during same week 3,538,852 bushels, an excess of receipts over deliveries of 654,498 bushels. As to gulf ports, on July 8 there were 4,067,620 bushels of grain in elevators distributed between New Orleans and Galveston, the elevators at Port Arthur and Texas City being empty. On July 9 there were 5,737 carloads of export food on hand at North Atlantic ports (exclusive of bulk grain) compared with 5,907 carloads on July 2, a decrease of 170 cars.

The threatened heavy loss of live stock brought about by severe drought conditions in Montana, Wyoming and North Dakota has caused the Railroad Administration to authorize special reduced rates effective immediately, both for the transportation of feed into the affected area, and for the shipment of live stock to other feeding grounds and to market. The rate concessions consist of the application of half the regular charges on shipments of all classes of stock feed into this area and a material reduction in the rates on cattle and sheep moving to outside grazing points and to be returned next spring when grass is again available. It is believed that this plan will result in saving much of the live stock in the area affected and will also permit restocking the ranges next spring.

While the movement of both freight and passenger traffic for the week ended July 14 generally showed some improvement over the week previous, according to a report made to the Director General, there was still a marked falling off in freight business compared with the same period in 1918. Despite the restrictions placed by the Railroad Administration against unnecessary travel due to the movement of returning soldiers from abroad, reports from the Allegheny region show that for the period July 3 to July 6, inclusive, 111,500 passengers were carried between Philadelphia and the seashore resorts, an increase of 112 per cent over the same period last year. While the commercial situation in the Southern region shows an improvement, freight loading for the week of July 14 showed a decrease of 9,171 cars under the corresponding period of 1918. In the Northwestern region the loading of iron ore showed a decrease of 7,000 cars compared with last year. Coal loading, likewise, fell off in this region.

New York Traffic Club

The Traffic Club of New York, 1,200 members, has sent to Congressman Esch, chairman of the House committee on interstate and foreign commerce, a statement of the transportation principles favored by the club. Government ownership is to be declared against the public interest. Remedial legislation is needed at this session of Congress; it should insure early return of railroads to their owners, provide uniform regulation in essentials, insure adequate revenue to provide for the equitable treatment of questions of wages and to attract capital for needed development. Government regulation should be reasonable and should encourage and protect the railroads. Private initiative should be fostered and preserved.

The committee of the club, in its letter, endorses House bill 4378 as regards empowering a governmental agency to require the unified use of transportation facilities, when necessary to cope with a shortage of cars or other emergency, but some of the proposed extensions of governmental authority are not approved; they will not foster private initiative and responsibility. The committee questions the propriety of the grant of unlimited authority to prescribe divisions between carriers; and to require a common carrier to extend its line or lines; the unlimited authority to compel the joint use of freight terminals; the substitution of an indefinite period of time for which the commission may order rates to continue in force in lieu of the period of not exceeding two years which is now provided by the law; and the prohibition against any person holding the position of officer or director of more than one carrier.

The committee believes that carriers should be allowed to agree upon common rates and on the adjustment of train schedules, subject to approval by the commission. The commission should be authorized and required to deal with petitions for correction of inequalities between intrastate and interstate rates. Section 14 should provide for insuring carriers adequate revenue to furnish safe and efficient service and to attract new capital where necessary. Rates in effect when federal control terminates should be continued until thereafter changed by lawful action. Controversies about railroad employees' wages should be taken to a governmental tribunal, upon which the Interstate Commerce Commission should be represented. Application of the long-and-short-haul law should continue to be left in the discretion of the Interstate Commerce Commission.

Equipment and Supplies

Locomotive Deliveries Week Ending July 5

New locomotives were shipped to railroads under federal control during the week ended July 5, as follows:

Works	Road	Number	Type
American	Vgn.	5	USRA Mallet
		5	
Baldwin	U. P.	1	Santa Fe
	B. & O.	4	USRA Pacific
	T. & P.	1	Santa Fe
	P. L. W.	1	Mallet
	Erie	5	USRA Pacific
	C. & O.	1	USRA Mount.
	B. & L. E.	5	USRA Santa Fe
	S. P.	1	Santa Fe
	P. & R.	1	Mallet
		20	
	Total	25	

Locomotive Deliveries, Week Ending July 12

The following new locomotives were shipped to railroads under federal control during the week ended July 12:

Works	Road	Number	Type
American	C. & N. W.	6	USRA 6-w. Sw.
	Virginian	3	USRA Mallet
		9	
Baldwin	A. T. & S. F.	4	Pacific
	A. T. & S. F.	3	Santa Fe
	B. & O.	1	USRA Pac.
	Col. & Sou.	2	USRA Santa Fe
	Erie	1	USRA Pac.
	Ga. R. R.	2	USRA 8-w. Sw.
	N. & W.	1	Mallet
	Penn. Lines	1	Mallet
	Sou. Pac.	1	Santa Fe
		16	
	Total	25	

Freight Cars

THE UNION SHIPBUILDING COMPANY, Baltimore, Md., is inquiring for one flat car.

BELASCO & COMPANY, New York, is inquiring for 100 to 200 steel dump cars for export to Europe.

THE LEHIGH VALLEY COAL COMPANY, Wilkes-Barre, Pa., has ordered 100 mine cars from the American Car & Foundry Co., Chicago.

THE SHAWMUT MINING COMPANY, St. Marys, Pa., has ordered 200 wooden mine cars from the American Car & Foundry Co., Chicago.

THE CHAMPION FIBRE COMPANY, Canton N. C., has ordered one 50-ton steel hopper car from the American Car & Foundry Co., Chicago.

Miscellaneous

THE CANADIAN NATIONAL RAILWAYS is calling for tenders for 6,500,000 ties, of which 3,525,000 are for use on the Western Lines, 1,400,000 for the Eastern Lines, 1,375,000 for the Central Lines, and 200,000 for the Halifax & South Western (Nova Scotia). These ties are for delivery between October 1, 1919, and October 1, 1920.

Spoil from the Subway.—Over 7,500 pairs of pick-wielding arms deserted America yesterday; each man carried away from $2,500 to $4,000. These arms belong to Italian laborers; and most of this money has been dug out of subways, mines, and railroad rights-of-way. These men sailed on three Italian steamships, and, so far as could be learned, none of them had any intention of returning.—New York *Globe*, July 16.

Supply Trade News

The Chicago Pneumatic Tool Company, Chicago, has removed its Minneapolis (Minn.) office from the Metropolitan Bank building to Fifth avenue and Fifth street south.

The Falls Rivet Company, Kent, Ohio, has been authorized by the stockholders to draw up plans for the construction of a new building at Kent. It is probable that work on the new structure will not begin before early spring.

The **Chicago Pneumatic Tool Company,** Chicago, announces the appointment of **N. S. Thulin** as special railroad representative on the staff of S. C. Sprague, manager of western railroad sales, with headquarters at the company's office in Chicago.

Kenneth R. Hare has been appointed district manager for the **Transportation Engineering Corporation,** New York, with headquarters at Chicago, in charge of the territory in the middle west, including Chicago, St. Louis and other important railroad centers.

Robert S. Hammond, formerly sales agent of the American Steel Foundries, Chicago, has been appointed Pittsburgh, (Pa.), representative of the **Whiting Foundry Equipment Company,** Harvey, Ill., with office in the Fulton building, succeeding **F. J. Page.**

Samuel F. Joor, who for the past year has been assistant chief engineer of the Semet-Solvay Company, Syracuse, N. Y. and formerly a consulting engineer with offices in Chicago has been appointed sales engineer for the **American Steam Conveyor Corporation,** Chicago.

J. J. Brown, vice-president and general manager of the **Wheeler Condenser & Engineering Company,** Carteret, N. J., has been elected president, succeeding **Charles W. Wheeler,** who died recently. **H. S. Brown** of Boston has been elected vice-president. Mr. H. S. Brown has been associated with the Power Specialty Company, New York, for the past 15 years, the greater part of this time as New England manager, and during the war he took an active part in government war work, with headquarters at Washington and Philadelphia. He is also president of the Brown-Ferries Company, Philadelphia.

Pratt & Lambert, Inc., Buffalo, N. Y., announces that its New York office at 185 Madison avenue, will be moved about November 1 to a new site in Long Island City, where a modern warehouse of brick construction, 200 ft. by 100 ft., consisting of two stories and basement, is now being built, not far from the Bridge Plaza, and **Donald L. Clement,** former railway representative, who has recently returned from overseas service, will be assistant resident manager of the New York office. In order to increase the production at the main factory, Buffalo, a four-story brick building 95 ft. by 45 ft., to be devoted to grinding, is to be put in service on October 1. At Bridgeburg, Ont., a four-story brick building, 85 ft. by 45 ft., is being erected in addition to new chimneys, double the size of the old, thinning buildings, filter buildings and other equipment which will triple the manufacturing capacity of the present factory.

Oscar Otto, general superintendent of the South Philadelphia Machine Works of the **Westinghouse Electric & Manufacturing Company,** died on June 30, as a result of injuries received in an automobile accident near Westgrove, Pa. He was born in Manitowoc, Wis., on January 2, 1859, and after finishing his apprenticeship course as a machinist in the Manitowoc shops of the Chicago & North Western, served during several years at various places in Wisconsin. He then entered the service of the Northern Pacific, at Tacoma, Wash., going from there to the Oregon Short Line, at Salt Lake City, Utah. In 1898 he returned to the service

of the Chicago & North Western as superintendent, at the Chicago shops. Prior to accepting a position as general superintendent of the Westinghouse Machine Works, at East Pittsburgh, Pa., in June, 1909, he was connected with the Chicago & North Western as general superintendent of its Chicago shops. When the Westinghouse Company opened its new plant at Essington, Pa., Mr. Otto supervised the installation of the machinery, and later in February, 1918, he was transferred to the new works, where he remained until his death.

Trade Publications

HEATERS AND BURNERS.—The Macleod Company, Cincinnati, Ohio, has issued Buckeye catalogue B, illustrating, listing and describing the weed burners, ground thawers, flare light, sand blast and cement blast gun, heating torches, incinerators, etc., manufactured by that company.

THE CLARK TRUCTRACTOR.—The Clark Tructractor Company, Chicago, has issued a 16-page booklet describing a three-wheeled industrial truck operated by a gasoline engine of the automobile type. Illustrations and explanations are also given of the application of this burden-carrying and tractor truck to various industrial purposes, both interior and exterior. Several photographs show the special mobility of this machine obtained through the use of only three wheels.

REINFORCED CONCRETE PRODUCTS.—The Massey Concrete Products Corporation, Chicago, has issued a general catalog in the form of a prospectus on the concrete pipes, slabs, piles, poles, posts, battery wells, buildings, etc., manufactured by this company. The booklet is well illustrated with photographs, drawings and tables. This general catalog is a forerunner of a series of supplements containing more detailed information about the individual products. The first two of these, on railway culvert pipe and on pipe for highway culverts and sewers, will be ready for distribution in the near future.

Reid in The National Republican

Taking the Count

Financial and Construction

Railway Financial News

OAKLAND, ANTIOCH & EASTERN.—The Oakland, Antioch & Eastern, the Oakland & Antioch and the San Ramon Valley are to be sold to a corporation to be formed for the purpose of operating the three lines as one system. Permission for the sale and amalgamation has been granted by the Railroad Commission of California. Stocks and bonds necessary to finance the reorganization are to be issued. Approximately 82 per cent of the security holders of the three roads have approved the plans for this reorganization. The new company is to have an authorized stock issue of $5,500,000, divided into $4,000,000 of common and $1,500,000 of preferred stock. It is also to have an authorized bond issue of $3,000,000. Creditors who have a first and direct lien on the property are to be paid in cash. This indebtedness, according to exhibits filed in the reorganization proceedings, will total $271,354.

Railway Construction

CANADIAN NATIONAL RAILWAYS.—Contracts have recently been let as follows: Grading for one additional main line track between Truro, N. S., and Belmont, about 7.57 miles, to the Bate, McMahon Company, Ltd., Ottawa; grading for one additional main line track between Springhill Junction and Maccan, about 9.13 miles, to A. Wheaton & Dominion Construction Company, Ltd., Halifax; grading for double track at Moncton on about 3.35 miles to A. Wheaton & Dominion Construction Company, Ltd.; grading for double track diversion from mile 108.21 to mile 112.91, between Ste. Rosalie and Charlotte, about 4.7 miles, to Walters, Doheny & Co., Montreal, and for the substructure for the bridge over Tantramar river, mile 85.6, Truro subdivision, consisting of two 250 ft. double track spans.

MORRISTOWN, SNEEDVILLE & KYLE FORD ELECTRIC.—Organized to build an electric line from Kyle Ford, Tenn., west, via Sneedville, to Briar Creek, thence south, via Luther, Treadway and Mooresburg, to Morristown, about 40 miles. There will be nine steel bridges on the line, also 17 trestles with an average length of 300 feet and two sub-stations. The promoters expect to develop a traffic in farm produce, lumber and ore. George L. Berry is president, Pressmens' Home, and J. N. Adams, engineer in chief, Charleston, Tenn.

NORTHERN PACIFIC.—A contract for the construction of a new passenger station at Brainard, Minn., to replace the one destroyed by fire, has been left to McManis & Tarnoski, St. Paul, Minn. The building will be 40 ft. by 162 ft., two stories high and basement, with a 40 ft. by 30 ft. covered platform at each end. It will be of concrete and brick, with Ludowici green tile roof, and tiled floors with oak finish on the first floor and birch and maple on the second floor. The first floor will contain a general waiting room, women's room, smoking room and baggage and express room; the second floor will be occupied by the officers of the Minnesota and International and the local Northern Pacific officers. The total cost, including track changes, will be about $100,000. Work was started the last week in June.

Losses of gasoline during transit, are estimated by one prominent producer and shipper of gasoline to amount to eight per cent,, considering only that shipped in tank cars. During 1918, about 3,500,000,000 gallons of gasoline were produced in the United States and much of it was shipped more than once. A loss of one per cent, at 20 cents a gallon, means a loss to the shippers and to the nation of $7,000,000. The railroad loss and damage figures recently published, are large, but the shippers' probable wastage through leakage and evaporation during transit is larger.

Railway Officers

Railroad Administration

Central Administration

H. P. Dougherty has been appointed assistant director of the Division of Labor.

J. W. Clark has been appointed manager of the Fire Loss and Prevention Section, succeeding **Charles N. Rambo.**

R. C. Mitchell, chief special agent of the Missouri Pacific, has been appointed chief of the secret service and police section of the Division of Operation, succeeding **W. J. Flynn,** who has resigned.

Operating

F. R. Bartles, superintendent of the Rocky Mountain division of the Northern Pacific, with headquarters at Missoula, Mont., who was granted leave of absence in September, 1918, to enter military service, has resumed the duties of superintendent; **W. C. Showalter,** division superintendent, with office at Missoula, has been transferred to the Montana division, with headquarters at Livingston, vice **T. F. Lowry,** who has been transferred to the St. Paul division with headquarters at Minneapolis, Minn., and **J. H. Johnson,** acting superintendent of the St. Paul division, with headquarters at Minneapolis, has resumed the duties of assistant to the general superintendent, with office at St. Paul.

David Kirk Orr, whose appointment as superintendent of the Monongahela Railroad, with headquarters at Brownsville, Pa., has already been announced in these columns, was born on November 24, 1865, in Allegheny City, Pa. He was educated in the Allegheny High School, the Western University of Pennsylvania and Geneva College, receiving the degree of A. B. from the latter institution in 1889. He began railway work on June 10, 1889, with the Norfolk & Western as a topographer's assistant, remaining in that position until September, 1890, when he went to the Pittsburgh & Lake Erie as transitman. He later served as assistant engineer on that road. In August, 1903, he went to the Monongahela Railroad as engineer, and subsequently served consecutively as chief engineer, assistant engineer and assistant chief engineer until his recent appointment as superintendent of the same road as above noted.

Lieutenant-Colonel G. E. Votaw has received his discharge from the army and resumed his duties as superintendent of the Portland division on the Spokane, Portland & Seattle with headquarters at Portland, Ore. He entered military service on April 1, 1918, as a captain in the railway transportation corps. On May 5 of the same year he arrived in France where he served as superintendent of the American service on the Paris & Orleans between Saumur and Gievres with headquarters at St. Pierre Des Corps. On Aug,ust 13 of the same year he was transferred to the American terminal at Is-Sur-Tille, serving there as terminal and division superintendent and commanding officer of the 58th regiment, transportation corps, until January 15, 1919. From that date until May 10, he acted in the capacity of general superintendent of the 13th Grand division in the Zone of Advance with headquarters at Commercy. Captain Votaw was commissioned major in the transportation corps on February 15, 1919, and a few months later was promoted to lieutenant-colonel.

Traffic

M. J. Ormond, assistant manager of the lighterage and foreign freight department of the Lehigh Valley, has been appointed foreign freight agent, with headquarters at New York.

Engineering and Rolling Stock

Bernard Blum whose promotion to engineer of maintenance of way of the Northern Pacific lines, east of Paradise, Mont., with headquarters at St. Paul, Minn., was announced in the *Railway Age* of July 11 (page 84), was born at Chicago, on February 12, 1883. He received his education at the Massachusetts Institute of Technology, graduating in 1904. He entered the railway service in 1905 with the Chicago Junction where he remained until March, 1907, at which time he joined the construction department of the Northern Pacific as an assistant engineer in Montana. In December, 1909, he was promoted to assistant division engineer at Livingston, Mont., and in October of the following year he became roadmaster at Duluth, Minn. Later he was promoted to assistant district engineer with headquarters at St. Paul, Minn., which position he held until January 1, 1917, when he was promoted to district engineer, of the lines east of Mandan, N. D., with headquarters at St. Paul, in which capacity he served until his recent promotion to engineer maintenance of way.

B. Blum

Obituary

John W. Evans, superintendent of the St. Lawrence division of the New York Central, with headquarters at Watertown, N. Y., died on July 23, in the city hospital at Watertown, following a stroke of apoplexy. He was born in 1864, at Remsen, N. Y., and in 1884 began railway work with the Utica & Black River, now a part of the New York Central. He later served as despatcher and chief despatcher on the same road until December, 1895, and subsequently served on the Choctaw, Oklahoma & Gulf, and the Atlanta & West Point. In November, 1900, he returned to the New York Central and was appointed train despatcher. He was promoted successively to assistant trainmaster, trainmaster and assistant superintendent; and since April, 1911, had been superintendent.

Kansas and Its Opportunities is the subject of a comprehensive booklet which has been issued by the agricultural section of the United States Railroad Administration. It sets forth in a striking manner the wonderful agricultural opportunities of the Sunflower State. Governor Henry J. Allen, in an indorsement of this publication, tells of the state's leadership in agriculture, her inestimable wealth of underground treasures of coal, salt, lead, zinc, oil and gas, and invites everybody to come and share in the large prosperity that comes through the development of the state's resources. The total area of Kansas amounts to 82,158 square miles, or 52,531,200 acres. Belgium is only one-seventh the size of Kansas, and the states of Pennsylvania and Indiana, or Maine and Ohio united, or all New England, with Delaware and Maryland for company, could find resting room on her ample bosom. Kansas, last autumn, sowed wheat on an area of 11,000,000 acres. Her wheat acreage alone exceeds, by 2,805,280 acres, the entire area of the Kingdom of Holland. Twenty-one specialists of the staff of the Kansas State Agricultural College have written articles for the booklet.

EDITORIAL

Railway Age

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It is unnecessary to mention the fact that the present is a time of great changes. The railroads are entering the period of reconstruction and plans for their future needs and development must be made by those upon whom this responsibility falls. In this work roads having automatic signals already installed are in a more favorable position to meet any traffic conditions that may arise than roads not so equipped. Because of this fact proposed budgets for future work should include estimates for signals on such parts of the systems as are congested or where numerous train delays are occurring under other forms of operation. Before deciding to build a second track on stretches of heavy traffic single track lines not operated by automatic block signals it will be well worth while to study the existing conditions to determine whether the relocation of passing sidings, coal and water stations and the installation of automatic signals will not increase the traffic capacity to such an extent that double tracking may be deferred for a number of years or perhaps indefinitely. Too much stress cannot be placed upon the importance of signals as a means of promoting safety to operation; but certainly too little stress has been placed in the past upon their value as means increasing track capacity and promoting economy.

Prepare for Increase in Traffic

The figures showing the exports of railway supplies compiled by the Division of Statistics of the Bureau of Foreign and Domestic Commerce indicate that the hopes of those who are interested in exports of these commodities are beginning to be realized. The exports of locomotives in May valued at $4,040,551, as briefly noted in last week's issue, were nearly double those of April and considerably in excess of any previous month this year. The exports of passenger and freight cars valued at $960,616 and $6,268,078, respectively, were several times in excess of those of previous months. The exports of car wheels and axles valued at $769,733 were less than in April but above those for March. The exports of railroad spikes were considerably in excess of those of any previous months this year while in the case of frogs, switches, etc., the total exports of $1,881,626 were about 75 per cent greater than those of April, the best previous month. Rails exported valued at $4,902,970 were not as great as in February, but they were considerably in excess of the figures for any other month. The figures quoted, to be sure, are to an extent only history. What counts is the business recently placed or in sight; but it is probable that the figures for May will be sustained and possibly exceeded in the following months. Japan has continued her buying of steel for railway purposes. Last week the Equipment and Supplies Column of this paper reported orders for 23 locomotives divided between four countries, Chile, Argentina, the Dutch East Indies and Formosa, in addition to orders for 432 freight cars for Peru, Colombia and Cuba, and what is more important, Rumania has been ready to place an order for locomotives, depending upon financial arrangements, and Poland is seeking to place in this country orders for a considerable quantity of railway supplies, also depending upon financial arrangements. The fact that the orders placed or pending are from widespread markets, and that some of them are of considerable quantity tends to confirm one's opinion that it is justifiable to feel even more optimistic than ever about export trade in railway supplies.

Our Export Trade

The article on concrete roadbed construction which appears on another page of this issue will be found of interest to all railway officers concerned with the present high cost of track maintenance. The report covers a rather comprehensive variety of special track designs which have been subjected to service of greater or less severity over a period of several years in widely separated parts of this country. Most of these designs were undertaken as a result of special conditions not encountered under the ordinary circumstances of railway building. It is a fact, however, that they have been carrying heavy traffic with low maintenance expenditures, although conclusive figures as to the relative cost of the ordinary track construction and any of the special forms described are still to be presented. After a century of railway development most of the tracks the world over now conform to a single standard of construction comprising three primary features, namely, the rails, the wooden cross ties and a flexible support permitting of more or less ready adjustment to compensate for the disturbances of traffic. Imperfect as this construction may be, it is simple of installation, repair and renewal and any device designed to supersede this established construction must show a definite economic advantage. But the track in the form we now understand it is far from perfect and the cost to maintain it when contemplated in terms of the enormous mileage now in use is very large, consequently there is every inducement for the exercise of inventive genius and outlay for experimental construction from which a pronounced improvement may ultimately be evolved.

Improving the Railway Track Structure

In all probability electrification in foreign countries will advance more rapidly in the next few years than it will here in the United States. There is a crying need for coal in a dozen European and South American countries and the price of railroad coal has jumped to figures varying from $20 to $46 a ton. One of the elements in the electrification question is train mile costs and these prices for coal have made consideration of this element necessary. There are no such prices now in the United States but with present day shipping facilities much American coal can be exported to foreign ports. Agents from the United States are now investigating conditions in many foreign ports concerning prices of coal, its market, port facilities for handling it, facilities for shipping coal to inland markets, etc. Furthermore, American producers are sending letters to foreign consumers explaining what they have to offer and requesting that they be favored with a trial order. The following is an extract from one of these letters:

Another Reason

"Gentlemen:—We are owners, miners and shippers of the very best grades of coal mined in the United States of America. Our produc-